DISSERTATION ON

"STUDY OF MATERNAL AND PERINATAL OUTCOME IN HEART DISEASE COMPLICATING PREGNANCY IN A TERTIARY INSTITUTION"

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CERTIFICATE

This is to certify that this dissertation **"STUDY OF MATERNAL AND PERINATAL OUTCOME IN HEART DISEASE COMPLICATING PREGNANCY IN A TERTIARY INSTITUTION"** submitted by **Dr.THAMIZHSELVI.N,** appearing for M.D OBSTETRICS AND GYNAECOLOGY Branch II Degree examination in April 2013 is a bonafide record of work done by her under my direct guidance and supervision in partial fulfillment of the regulations of the Tamilnadu Dr.M.G.R Medical University, Chennai. I forward this to the Tamilnadu Dr.M.G.R Medical University, Chennai, Tamilnadu, India.

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DECLARATION

I solemly declare that this dissertation entitled "**STUDY OF MATERNAL AND PERINATAL OUTCOME IN HEART DISEASE COMPLICATING PREGNANCY IN A TERTIARY INSTITUTION**" was done by me at Institute of obstetrics and gynaecology , Madras Medical college during 2011-2012 under the guidance and supervision of, **Prof.Dr.GEETHA PRASAD MD DGO .**This dissertation is submitted to the Tamil Nadu Dr.M.G.R.Medical University towards partial fulfillment of requirements for the reward of M.D. Degree in Obstetrics and Gynaecology (Branch-II).

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CONTENTS

INTRODUCTION

Heart disease in pregnancy is one among the major medical problems complicating pregnancy. Heart disease ranks third among the most common causes of maternal mortality. Obstetric haemorrhage is the first and pre eclampsia is the second most common causes of maternal mortality. When a patient with heart disease becomes pregnant, the already diseased heart is overloaded due to the haemodynamic changes that occur in pregnancy and this poses a risk on the maternal and fetal health and the maternal fetal prognosis become poor. This emphasises the importance of pre-conceptional counselling in a patient with heart disease and termination of pregnancy at the earliest in patients with high risk heart disease.

As obstetricians we face the challenge of preventing pregnancy, which is an added burden on the already diseased heart from hastening the rate of decline of patient's general condition.

Patients with poorly compensated heart disease were strongly discouraged from conceiving in the past. Nowadays comprehensive cardiac care and obstetric care including infertility treatment have

improved tremendously and this helps the patients with heart disease to undergo a safe pregnancy and delivery.

In a developing country like India even now rheumatic heart disease is the most common cardiac lesion seen in association with pregnancy.

Pregnancy in patients with heart disease requires comprehensive healthcare to be given by obstetricians, cardiologists, anaesthetists and paediatricians.

And especially obstetricians are in a position to make crucial decisions to provide a good maternal and perinatal outcome.

AIM OF STUDY

1. To analyse the impacts of heart disease on pregnancy.
2. To study the impacts of pregnancy on heart disease.
3. To analyse the possible prognostic factors which facilitate formulation of guidelines for a safe motherhood.
4. To study the maternal and perinatal outcome.
5. To study the role of medical termination of pregnancy and permanent method of sterilisation in patients with heart disease.

REVIEW OF LITERATURE

A historical study conducted by Hamilton and Thompson at the Boston lying in hospital between 1921 and 1938 was the first ever study on heart disease complicating pregnancy.

The first ever study in India was conducted in mid 1950s by Sudhir Bose from Calcutta and by Masoni from Bombay. They were followed by a number of studies and these studies were carried out in India as well as in other countries. With the available data from these studies the incidence of heart disease in pregnancy ranges from 0.2 to 0.97%[1].

In the United States of America, the incidence of heart diseases of rheumatic origin has declined considerably and the incidence is almost Nil[2]. However the incidence of congenital heart diseases and the heart diseases of other origin like ischemic heart disease, cardiomyopathies, pulmonary hypertension etc. has increased in a significant manner.

The first ever largest study on heart disease complicating pregnancy was conducted during the period between 1942 and 1971 by Szekely and Snaith. Nearly a thousand patients suffering from various types of heart diseases, who were admitted in New Castle

General Hospital, were observed in this study[4]. The report of this study was that the incidence of rheumatic heart disease has declined remarkably over the past three decades. In this study, Mitral stenosis continued to be the dominant lesion with an incidence of 90%. 15.4% of these patients under study developed pulmonary congestion and 1.6% of these patients developed pulmonary oedema. Heart failure complicated 1.8% of the patients. Maternal mortality was 1.6% and the major cause of death was acute pulmonary oedema.

In 1970, a study conducted on 1192 patients with rheumatic heart disease and congenital heart disease in the Queen Charlotte Hospital by Barnes during a 20 year period from 1947 to 1966 reported that rheumatic heart disease was seen in 88.2% of the study population and congenital heart disease in 11.8% of the study population indicating that rheumatic heart disease is the most common type of heart disease.

Meyer and colleagues conducted a study over one decade and reported in1994 which stated that, of the 74 patients with heart disease complicating pregnancy studied during this period only a few patients gave a positive history of Rheumatic fever.

Bitsch and colleagues in 1989 and Mcfaul et al in 1988 conducted various studies on antenatal mothers with heart disease and

reported that over 50% of the study population was suffering from congenital heart disease. In a study by Tan and De Swiet[5] reported in 1998 conducted on 73 women, the results showed that in only 12% of study population the cardiac disease is of Rheumatic origin.

Brickner and colleagues in 2200 reported that with the advancements in the surgical techniques and improvements in the medical management, there is a significant increase in the number of women with congenital heart disease reaching child bearing age.

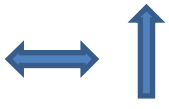
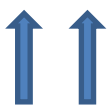
According to Sach et al (1988)[6], the maternal mortality due to heart disease was 0.3 to 5.6 per lakh live births in a study conducted from 1954 to 1985. Heart disease has been reported as the cause of maternal death in 8.5% cases in a study conducted between 1968 and 1993 by Ayhan et al (1994)[7,8]. According to Martin and associates (1999), Heart disease remains to be the third leading cause of death after haemorrhage and anaemia.

HAEMODYNAMIC CHANGES IN PREGNANCY

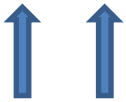
A plethora of studies conducted by numerous authors have made extensive contributions which made us to understand the hemodynamic changes in pregnancy. The most important of these studies was the one conducted by Clark and associates in 1989. In this study, 10 healthy primigravidae were included and cardiac

catheterisation on the right side of the heart was performed from 35 to 38 weeks of gestation and also at 11 to 13 weeks after delivery. This study contributed extensively in defining the normal haemodynamic values in late pregnancy.

A study conducted by Katz and associates (1978)[9], which made use of echocardiography, was done in normal pregnant women and these patients were again subjected to echocardiography in the postpartum period. Riccarda Del Bere and associates reported in 2001[10], about a study conducted on the effects of posture on the haemodynamics and cardiac output and these parameters were measured in normal pregnant women in all the three trimesters of pregnancy, 3 months before delivery during labour and 6 months postpartum in their supine and standing postures.[11]

PARAMETER	MODIFICATION	MAGNITUDE	PEAK	REFERENCE
Oxygen consumption (VO_2)		+20% +40% to 60%	Term	Gemzell,1957 Permoll,1975
Oxygen delivery		700-1400ml/min	Term	Hankins,1996
Blood volume Plasma volume		+45% to 50%	32weeks	McLennon,1948
Red cells		+25% to	30-32	Jepson,1968

		32%	weeks	Letsky,1995
Total body water	↑	+6 – 8 litre	Term	Scitchilk,1967 Lindheimer1973
Resistance changes Systemic circulation	↓	-2%	16-24 Weeks	Bader,1955
Pulmonary circulation	↓	-34%	34weeks	Kitabatake,1983 Clark,1989
Blood pressure (SVR & CO) Systolic	↓	-9%	25weeks	Wilson,1980
Diastolic	↓	(Slightly more on diastolic)		
Myocardial contractility Chronotropism (HR)	↑	+20% to 30%	Term	Wilson,1980
Inotropism (SV)	↑	+11% to 32%	Term	Mabie,1994 Robson,1989
Cardiac output (HR×SV)	↑	+30% to 50%	Term	Gemsell,1957 Hendricks,1958 Ucland,1969 Robson,1989 Van Oppen,1996
Uteroplacental circulation	↑	+> 100%	Term	Metcalfe,1955 Assail,1960

 : MARKED INCREASE

 : INCREASE

 : DECREASE

 : NO CHANGE

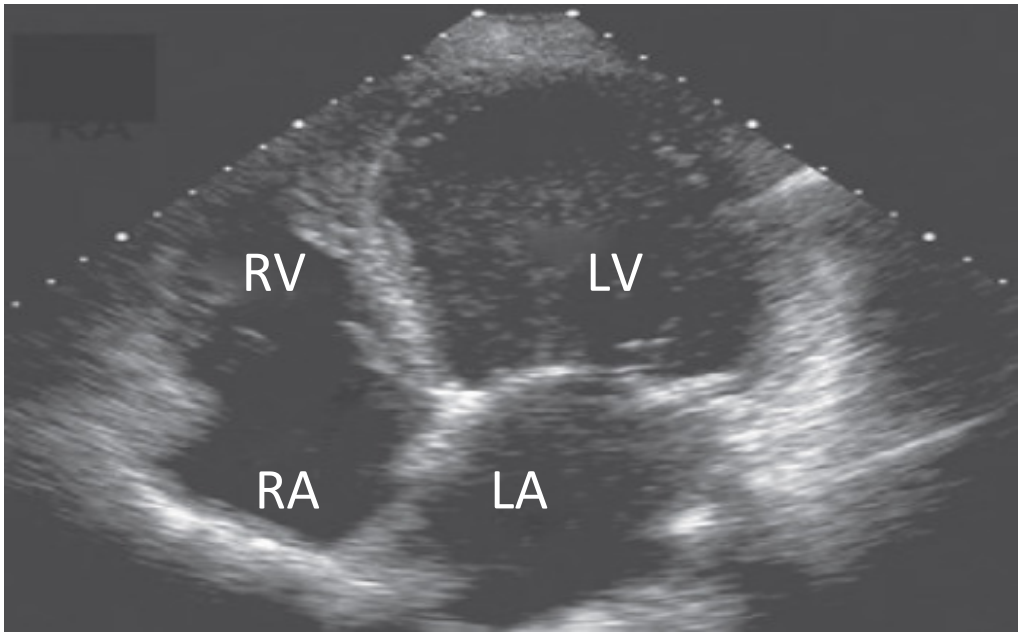
SVR : SYSTEMIC VASCULAR RESISTANCE

CO : CARDIAC OUTPUT

DIAGNOSIS OF HEART DISEASE IN PREGNANCY

In a normal pregnant patient, the cardiovascular system undergoes drastic changes and this makes the diagnosis of heart disease more complicated in pregnant patient. The normal structural and functional changes that usually occur in pregnancy can give rise to signs and symptoms that mimic a heart disease. Otherwise, these changes can also conceal an existing heart disease. MetCalfe and associates (1986), devised a few clinical indicators of heart disease in pregnancy. Elkayam and GllicheeN(1990)[12] outlined a few symptoms and signs suggestive of cardiac disease in pregnancy. With the help of these formulations, supported by investigations like ECG and

Fig1: apical four-chamber view of heart.



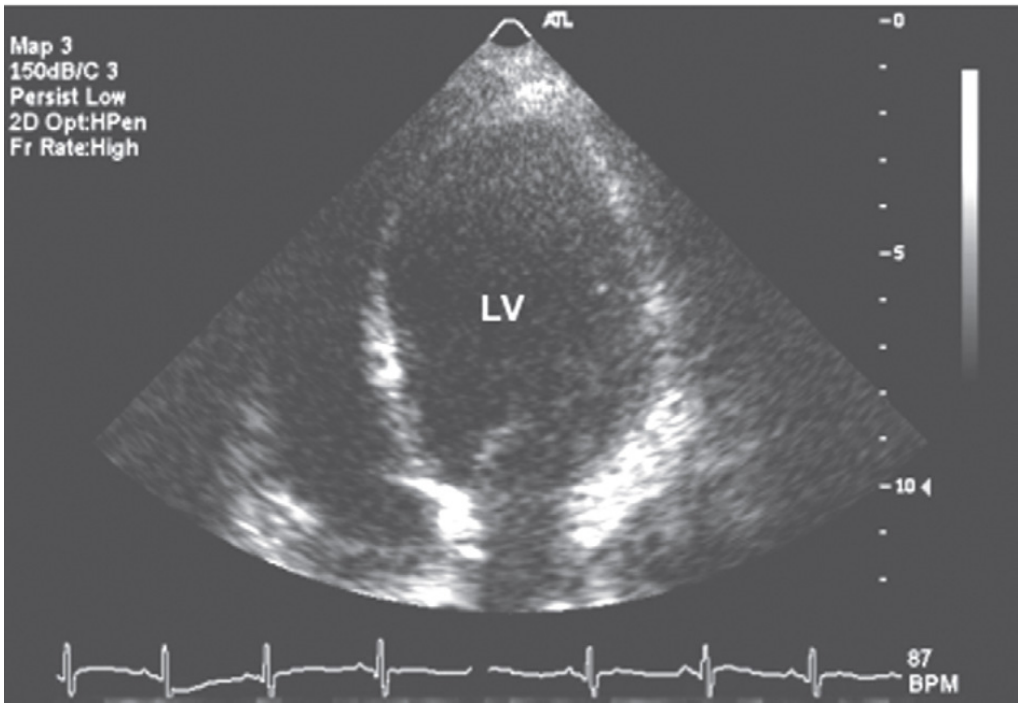


Fig 2: Two-dimensional echocardiogram (parasternal four chamber) showing a dilated, thinned left ventricle (LV).

echocardiography, the diagnosis of organic lesions of heart in a pregnancy turns out to be simple.

Limachar and co-workers (1985)[13] conducted studies on pregnant women employing two dimensional echo and pulsed Doppler echo.

CLINICAL CLASSIFICATION

The first ever classification for the assessment of functional capacity was published in1928 by the New York Heart Association[14]

and it has been revised for the 8th time in 1979.one important change was the addition of assessment of cardiac status after all data have been reviewed. Thus the classification no linger based on symptoms alone.

Classification of the functional capacity recommended by the New York Heart Association (used for classification of dyspnoea due to heart failure)

Class I: Patients with cardiac disease, but without resulting limitation of physical activity. Ordinary physical activity does not cause undue fatigue, palpitation, dyspnoea, or anginal pain.

Class II: Patients with cardiac disease resulting in slight limitation of physical activity. They are comfortable at rest. Ordinary physical activity results in fatigue, palpitation, dyspnoea, or anginal pain. They are comfortable at rest. Less than ordinary activity causes fatigue, palpitation, dyspnoea, or anginal pain.

Class III: Patients with marked limitation of physical activity.

Class IV: Patients with cardiac disease resulting in inability to carry on any physical activity without discomfort. Symptoms of heart failure or of the anginal syndrome may be present even at rest. If any physical activity is undertaken, discomfort is increased.

PRECONCEPTIONAL COUNSELLING

The entity of pre-conceptional counselling turn out to be noteworthy when a patient with severely compromised or a high risk heart disease wishes to conceive. The American College of Obstetricians and Gynaecologists (1992)[16] had implemented the three tier system of classification in pregnancy according to the risk of death in pregnancy. This helps to counsel the women regarding the appropriateness of conception and or continuation of pregnancy. The risk of death in

RISK FOR MATERNAL MORTALITY CAUSED BY VARIOUS HEART DISEASES[15]

GROUP	RISK	MORTALITY
ROUP 1	MINIMAL RISK Atrial septal defect Ventricular septal defect Patent ductusarteriosus Pulmonary or Tricuspid disease Tetralogy of Fallot corrected Bioprosthetic valve Mitral stenosis NYHA class I & II	0.1%
GROUP 2	MODERATE RISK Mitral stenosis NYHA class III & IV Aortic stenosis Coarctation of aorta without valvular involvement Tetralogy of Fallot uncorrected Previous myocardial infarction Marfan's syndrome with normal aorta	5 -15%
GROUP 2B	Mitral stenosis with atrial fibrillation Artificial valve	
GROUP 3	MAJOR RISK Pulmonary hypertension Coarctation of aorta with valvular involvement Marfan's syndrome with aortic involvement Eisenmenger's syndrome Peripartum cardiomyopathy	25 -50%

pregnant patients with heart disease was also published by Clark and co-workers in 1997.

RHEUMATIC HEART DISEASE

According to Carabello and Crawfird (1997) this might also result in the development of passive pulmonary hypertension and fixed cardiac output. According to a study conducted by Caulin Glaser and Setaco (1999) 2.5% of pregnant women with mitral stenosis develop congestive cardiac failure for the first time in pregnancy.

A study published by Desai and associates (2000)[17] stated that pregnant patients with Mitral Stenosis develop symptoms only when the diameter of mitral valve orifice is < 2.5 cm^2. Once these patients go into labour, adequate pain relief, comfortable back rest and anxiolytic measures become mandatory to prevent the development of congestive cardiac failure in these patients.

Epidural analgesia during labour is ideal for pain relief. Rational use of intra-venous fluids at the rate 75ml/hr prevents volume overload. Clark and colleagues in 1985[18] proposed a hypothesis which stated that the rise in the pulmonary capillary wedge pressure in the immediate postpartum period is a result of loss of resistance in

placental circulation and increase in the venous return from the lower limbs, pelvic veins and postpartum uterus which is an example for the state of auto transfusion. Sudden increase in the preload leads to the rise of pulmonary capillary wedge pressure and the patient develops pulmonary edema[19]. This strongly supports the concept of rational use of intravenous fluids and hence volume overload can be prevented(Ramin and Gilstrap in1999).

Aortic stenosis is the second most common cardiac lesion to be diagnosed after mitral stenosis. The haemodynamic abnormalities are the consequences of fixed cardiac output seen in the patients with aortic stenosis. Certain issues we come across in a pregnant patient including blood loss during delivery, regional analgesia in labour, and venocaval compression by the gravid uterus further more decrease the preload and worsens the state of fixed cardiac output. Lao and co-workers in 1993 reported 7% of collective mortality in patients with severe form of aortic stenosis.

Amongst the fairly well tolerated cardiac lesions in pregnancy lie the mitral valve incompetence and the aortic valve insufficiency. Decrease in the vascular resistance during pregnancy reduces the severity of these lesions. This concept was proposed by MC Anulty

and associates in 1988 and also by Mendelson and Lang in 1998. Occurrence of mitral and aortic valve incompetence has been associated with the use of fenfluramine, which is an appetite suppressant. This has been hypothesized based on the results of various conducted by Gardin et al in 2000, Pick et al in 1998 and Khan et al in 1998.

CONGENITAL HEART DISEASE

In the western countries, the ratio of congenital and rheumatic heart disease has undergone a change over the past five decades. Patients with small to moderate shunt lesions (left to right), VSD, ASD and PDA tolerate pregnancy well. According to Perloff[20] (1997) 80-85% of adults with significant congenital heart disease have undergone some kind of surgical intervention in childhood.

Women who suffer from a cyanotic congenital heart disease perform poorly in pregnancy, particularly in patients with uncorrected Tetralogy of Fallot the maternal mortality reach up to 10%[21]. Sawney and co-workers in 1999 published a report which states that still birth occurs in 14% and fetal growth restriction occurs in 36% of patients.

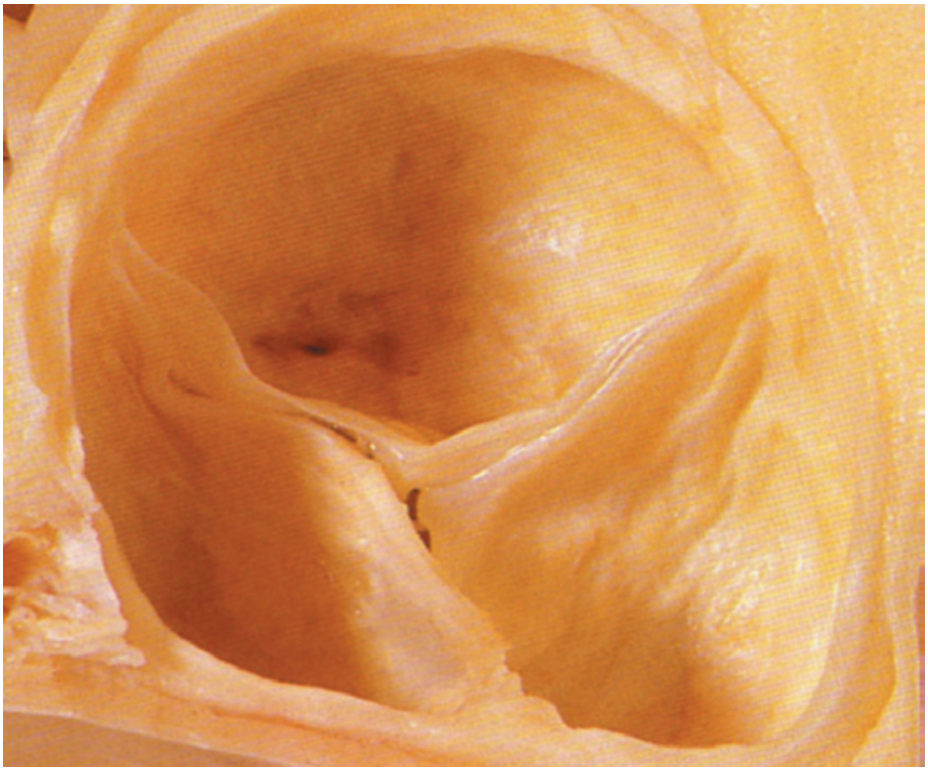


Fig 3: Normal Aortic Valve

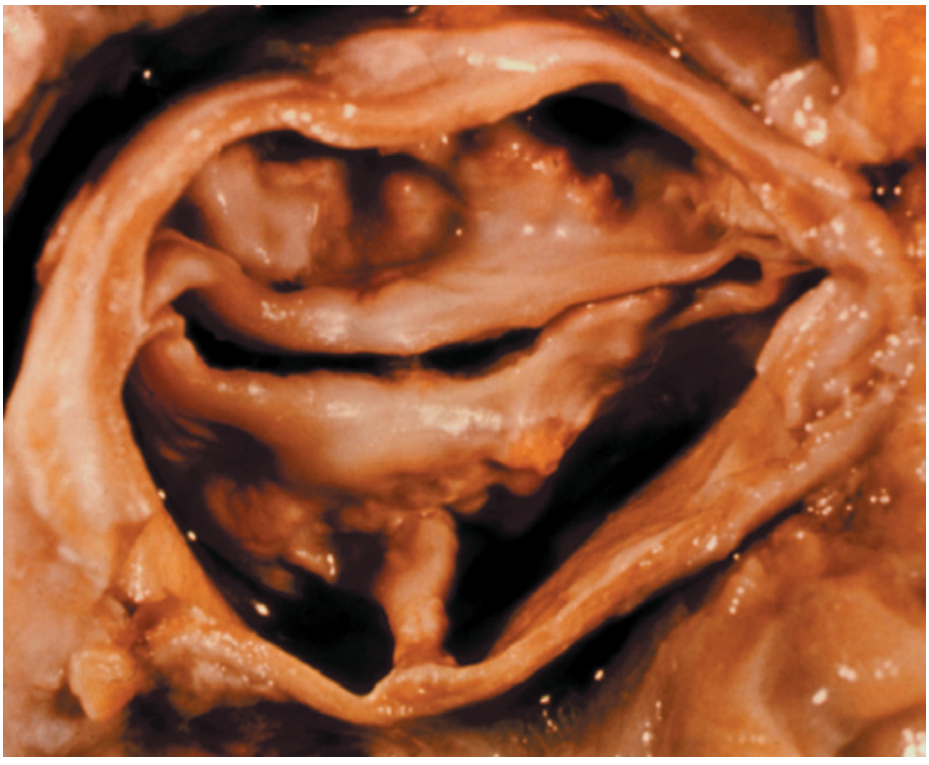


Fig 4: Bicuspid Aortic Valve

Zuber and associates (1999) [22]reported favourable outcomes in 19 pregnant patients with Fallot's tetralogy[24] and the patients selected for this study had a good ventricular systolic function and favourable functional class in pregnancy. Siggn et al in 1999 reported that patients who underwent surgical correction of Tetralogy of Fallot[25] before pregnancy showed a fairly good outcome in pregnancy. Connolly and associates (1999)[23] published that patients who had already undergone surgical correction of TGA in childhood have favourable outcome in pregnancy.

As per the report given by Perloff, the incidence of pulmonary stenosis in general population is 10% and pregnancy is well tolerated by women with these stenotic lesions. In women below 30 years of age, the most probable cause of aortic stenosis is the presence of Bicuspid aortic valve[26]. The average life expectancy in a patient with Aortic Stenosis once the patient develops exertional dyspnoea is only 5 years[27]. Development of symptoms in a patient with aortic stenosis is an indication for valve replacement. As a general rule, balloon valvotomy[28] in these patients with aortic valve disease is not performed as the rate of occurrence of serious complications is nearly

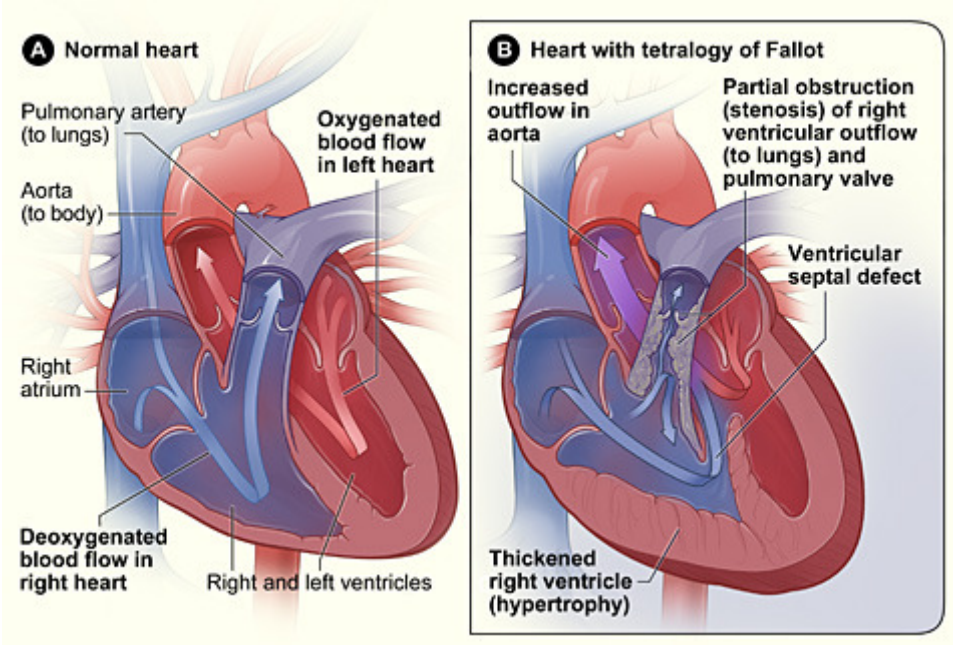


Fig 5: pathogenesis in Tetralogy of Fallot

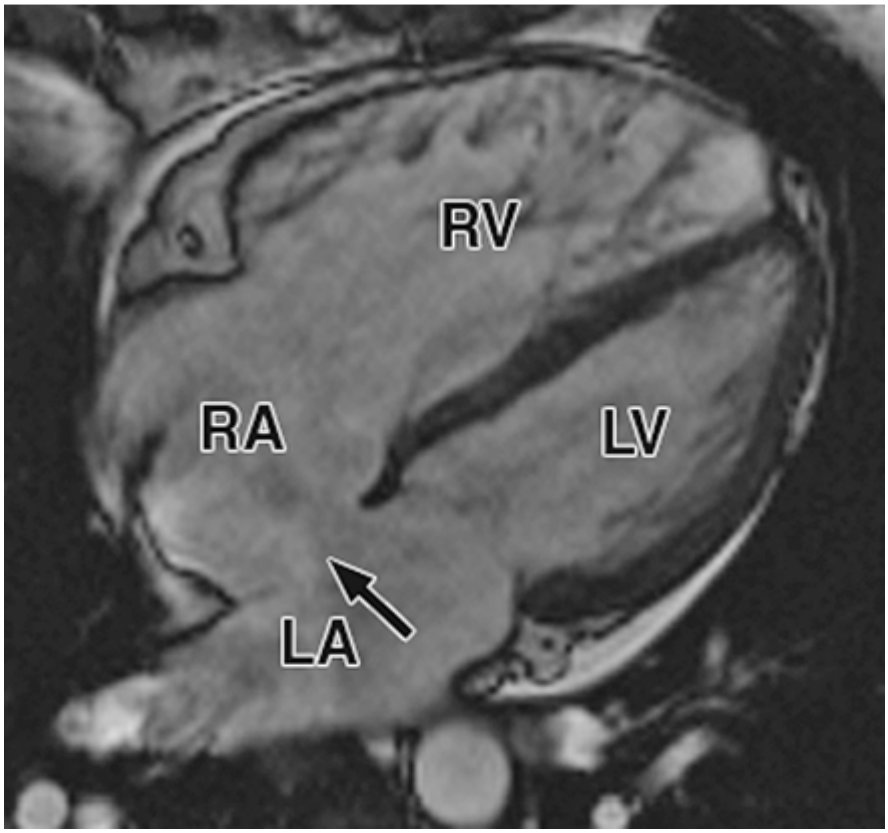


Fig 6: large atrial septal defect in MRI

10% and the complications include stroke, aortic rupture, aortic valve insufficiency and finally death. (Carebello and Gawrod, 1997). When the patients with aortic stenosis go into labour and delivery, they should be managed on the wet side with IV fluid infusion at the rate of 125 to 150 ml/hr[29].

Whitmore and colleagues(1982), and Shimi and associates (1987) proposed that the inheritance of congenital heart disease in the off springs born to mothers suffering from congenital heart disease is 5 to 10%.

ELLIS-VAN CREVELD SYNDROME

Ellis-van Creveld syndrome[30] (six–fingered dwarfism / digital integer deficiency) is a condition which includes a number of anomalies including post-axial polydactyly, congenital heart defects (most commonly an atrial septal defect producing a common atrium, occurring in 60% of affected individuals), pre-natal tooth eruption, fingernail dysplasia, short-limbed dwarfism, short ribs, cleft palate, and malformation of the wrist bones[31].Thissyndrome occurs in 1 in 60,000 to 200,000 newborns. It has an autosomal recessive inheritance. This syndrome is the result of a mutation in the EVC gene and EVC2 gene[32].

MISCELLANEOUS HEART DISEASES

PULMONARY HYPERTENSION (PHT)

According to Weiss and co-workers (1998), the maternal mortality rate in patients with pulmonary hypertension is 30%[33]. Also in patients with pulmonary hypertension, that occur secondary to cardiac or pulmonary diseases or recurrent pulmonary emboli or drug abuse, maternal mortality is significant.

Eden borough and associates (2000) published a report which states that the prognosis of patients with cystic fibrosis[34] becomes poor once they develop complications like pulmonary hypertension and corpulmonale. And these patients are at greatest risk during labour and delivery, as the venous return and in turn the right ventricular filling is lessened and this is linked to majority of the maternal deaths.

Easter ling and colleagues (1999) used nifedipine and prostacycline infusion in pregnancy with success. Weiss and associates (2000) reported that a patient with severe pulmonary hypertension underwent a successful caesarean section under epidural analgesia.

MITRAL VALVE PROLAPSE

It is a connective tissue disorder and is most often inherited and is seen in 15% of otherwise healthy young women. Pathology of this condition is that there is myxomatous degeneration of the valve leaflets, annulus and chordate tendinae. These patients have a favourable pregnancy outcome[35] (Chia and co-workers, 1994). Patients with regurgitant lesions require antibiotic prophylaxis against infective endocarditis according to Degani and associates (1989).

DISEASE OF AORTA

Marfan's syndrome[36] and coarctation of aorta are the pathological conditions of aorta we are more concerned about in a pregnant patient. They are associated with a greater risk of aortic dissection. According to Pepin and associates (2000) the rate of occurrence of aortic dissection and aortic rupture was more in patients with Ehler-Danlos syndrome[37]. According to a report published by Simpson and D.A.Hon (1997), 50% of the aortic dissections that occur in women less than 40 years of age occur in late pregnancy.

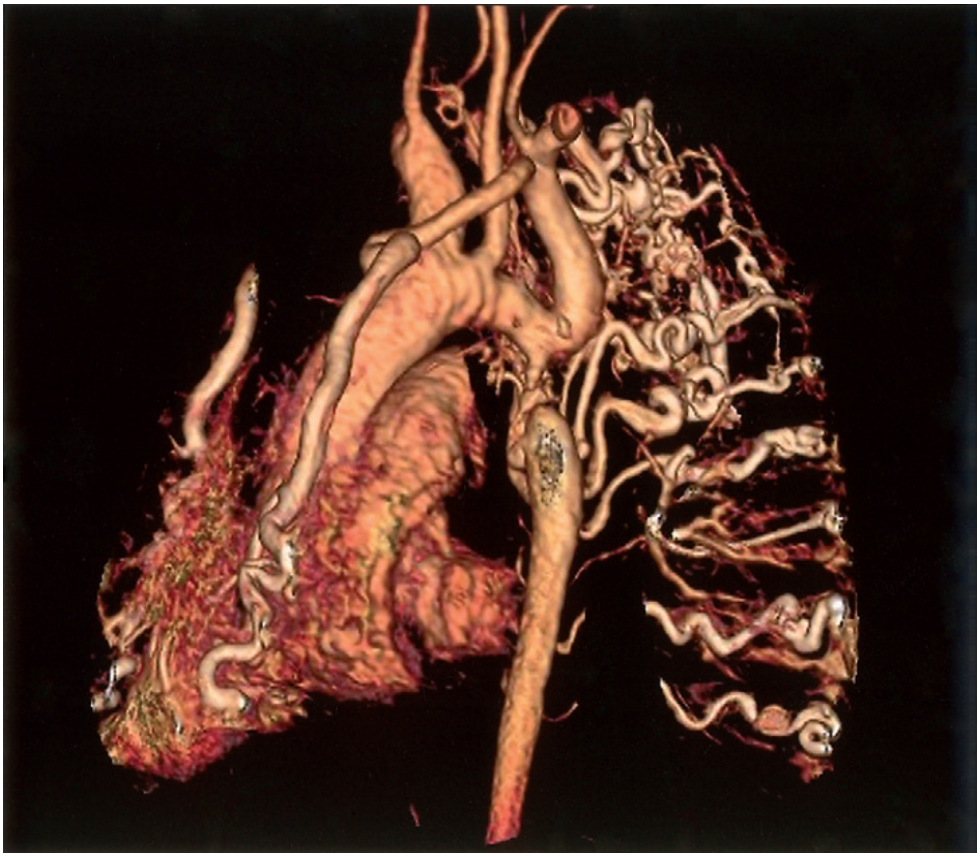


Fig7:Magnetic resonance imaging scan of a 34-year-old with severe coarctation of the aorta (near interruption), with multiple and very large collateral vessels.

Easter ling and associates (1991) reported that in a normal pregnant women the aortic diameter increases considerably during

pregnancy and this much more enhanced in case of a women with preeclampsia. The most important complications associated with the coarctation of aorta are congestive cardiac failure, infective endocarditis of the accompanying bicuspid aortic valve and the most dangerous complication is aortic rupture. McAnulty and associates(1990) reported 3% maternal mortality. Coarctation of aorta is inherited in 2% of off springs.

SURGICALLY CORRECTED HEART DISEASE

Morris and Menashe (1991) conducted a retrospective study in Oregan from 1958 to 1989[38] and reported that out of the 2700 children who underwent corrective cardiac surgery during childhood, more than 75% reached the reproductive age group. Perloff[39] (1997) gave a report which states that only 15 to 20% of patients with congenital heart disease had not undergone any previous surgical intervention. Congenital cardiac lesions that remain undiagnosed until adulthood are Atrial Septal Defect, Pulmonary Stenosis, Bicuspid Aortic Valve and Coarctation of Aorta as per the reports of Brickner and co-workers (2000).

VALVE REPLACEMENT

Nargorney and Field in 1981 reported favourable outcomes in pregnant patients who underwent replacement of even upto three valves. Sharouni and Doakley (1994) have published their experience in treating 150 pregnant women with prosthetic valves. Chan and colleagues[40,55] (2000) reassessed 28 studies reported upto 1997 and came to a conclusion that continued use of warfarin during pregnancy is linked with a good maternal outcome. Nevertheless the rate of occurrence of embryopathy was 6.4%. Fortunately heparin substitution during the period of organogenesis eliminated embryopathy[41]. However the use of heparin in pregnancy is related to considerable increase in the rate of occurrence of thromboembolic complications.

Low dose heparin is shown to be inadequate[42,54] and one study conducted by IturbeAlerris and associates(1986) showed that out of the 35 women taking heparin, 3 women developed massive thrombosis resulting in death in 2 of these patients. Chan and associates in 2000 reported a maternal mortality rate of 2.9% in these patients. Lee and coworkers (1994) reported a favourable outcome in

95 pregnant women and 57 of these women had a porcine graft and 4 patients out of these 57 patients developed dysfunction of valves.

CARDIAC SURGERY IN PREGNANCY

Pavan Kumar and associates (1988) published a study which reported the results of closed mitral valve commissurotomy in pregnancy. Many similar studies[42] had been conducted worldwide and the overall perinatal mortality was 7% and there was no maternal death during the procedure.

Of late, percutaneous transcatheter balloon valvotomy[44] of the mitral valve in pregnancy is being performed and revealed good results in the study published by Gupta et al (1998) and by Caulin, Glaser and Setaco (1999).

The first ever case of open heart surgery[45] with cardiopulmonary bypass performed on a pregnant patient was reported by Layse and associates in 1958. Neiss and associates (1998) reviewed the studies conducted in 70 patients. 59 out of these 70 patients underwent cardiopulmonary bypass surgery during pregnancy following which 6% maternal death and 30% perinatal death has been recorded.

In the present-day, concurrent caesarean section and open heart surgery is being performed once term pregnancy is reached. Birincioglu and associates (1999) published a report on six women who underwent mitral valve replacement in combination with caesarean section[46].

PREGNANCY SUBSEQUENT TO HEART TRANSPLANTATION

Lowenstein et al reported a first ever case of fruitful pregnancy in a patient who had already undergone heart transplantation. Key and co-workers (1989) and Kim and associates as well conducted an exhaustive data that reported that the transplanted heart in the pregnant patients reacted well to the haemodynamic changes that normally occur in pregnancy47). Troche and associates (1998) reported about 10 pregnancies and Dashe and co-workers (1998) reported about 29 pregnancies in patients following heart transplant and there was no maternal death directly due to obstetric cause[48].

PERIPARTUM CARDIOMYOPATHY

Peripartum cardiomyopathy[49] is a idiopathic cardiomyopathy that is defined as deterioration in cardiac function presenting typically between the last month of pregnancy and up to five months postpartum. PPCM is a form of dilated cardiomyopathy. Fatkin and associates (1999), reported that inheritance of idiopathic cardiomyopathy occurs in nearly one third of the cases. The patient is considered to have PPCM when all the causes of heart failure are excluded according to Broan and Bertelet (1998)[50] and Hibhaw and co-workers (1999)[51]. Ford and associates reported good prognosis in women with idiopathic cardiomyopathy i.e., PPCM. According to Lampert and colleagues (1997)[52,53], 50% of women diagnosed to have peripartum cardiomyopathy regained their normal left ventricular function within 6 months of diagnosis.

INFECTIVE ENDOCARDITIS

Infective endocarditis is not common during pregnancy and puerperium. According to Cox and colleagues (1988), the incidence of infective endocarditis in pregnancy is 1 in 16,000 deliveries. Cox and Leveno (1989) reported that the overall maternal mortality.

CONTRACEPTION IN CARDIAC PATIENTS

Contraception in heart patients is very important as these should limit their family size and complete their families before there is serious cardiac decompensation[56]. There are a few choices of temporary methods of contraception left for these patients (Pearse,1984). Oral contraceptives carry the risk of hypercoagulability, thromboembolism, hypertension and hyperlipidemia. IUCD carry the risk of vasovagal syncope due to pain at the time of insertion of the device and infection. Vasovagal syncope can be prevented by using smaller sized Copper-T and infection can be prevented by giving prophylactic antibiotics (Brenner 1975). Conventional barrier methods of contraception such as condoms, diaphragms, and foams are safe but have a high failure rates.

Low dose oral contraceptive pills are safe and preferable to IUCD. After the completion of family, permanent method of contraception is recommended in these patients[57].

MATERIALS AND METHODS

The study of maternal and perinatal outcome in heart disease complicating pregnancy was conducted in the Institute of Obstetrics and Gynaecology, Egmore, Chennai. This study was performed during the period between January 2011 and July 2012 for 18 months and a total of 302 cases heart disease complicating pregnancy were included in the study.

METHODOLOGY

Methodology included

(i) Meticulous history taking including significant history of Rheumatic Fever

(ii) History of decompensation in preceding pregnancies

(iii) Details of the heart disease

(iv) Details of medical and surgical treatment of Heart Disease

(v) A methodical clinical examination

INCLUSION CRITERIA:

All pregnant women with various Heart Disease (Rheumatic, Congenital, Valvular, Ischemic etc.,) who attends OPD in IOG, Egmore. Pregnant patients with heart disease who are admitted for safe confinement and pregnant patients with heart disease who undergo MTP

EXCLUSION CRTERIA:

All pregnant women without any Heart Disease, all heart disease patients with pregnancy who have abortions, vesicular mole, blighted ovum and heart disease patients who get admitted for reasons other than safe confinement. All antenatal women who were diagnosed to have a Heart Disease and women who had undergone surgeries for the heart disease were involved in this study.

All pregnant women who donot have heart disease but presenting with symptoms and signs suggestive of heart disease were subjected to meticulous history taking and detailed examination and cardiologist opinion was obtained for these patients and the patients newly diagnosed to have a heart disease were included in the study. Echocardiogram was beneficial in diagnosing an organic lesion of the heart.

Once a clinical diagnosis was achieved, these patients were subjected to a series of investigations including complete blood count, random blood sugar, renal function and liver function tests and urinalysis to diagnose and treat anaemia and urinary tract infection. All patients were subjected to Electrocardiogram and Echocardiogram. Patients were categorised according to NEWYORK HEART ASSOCIATION classification and dealt withaccordingly.

ROUTINE MANAGEMENT

Antenatal women diagnosed to have a definitive heart disease were admitted first for thorough evaluation and the clinical grading of the patients' functional status was made. If the patient fall into the functional class I and II, they were discharged and advised to attend the antenatal OPD regularly. The cardiac status of the patient determines the frequency of the antenatal visits. These women were counselled regarding the importance of adequate rest, and were instructed to avoid heavy work, emotional stress, and to consume a high calorie, salt restricted diet.

Anaemia, once diagnosed, was corrected in early pregnancy without delay. Infections, if present, were vigorously treated with the appropriate antibiotics. Benzathine penicillin prophylaxis was

routinely given for patients with rheumatic heart disease as per cardiologist's advice and these patients were sent for periodic cardiologist review. Patient presenting with features of decompensation, at any trimester, were hospitalised immediately and treated as per cardiologist's advice. Otherwise patients were routinely admitted from 32 to 34 weeks for safe confinement.

Patients with decompensated heart were admitted in Intensive Care Unit and provided strict bed rest, oxygen, diuretics and digoxin. If the patient is put on long term digoxin and diuretics, potassium supplement in the form of KCl syrup was given for fear of hypokalemia.

MANAGEMENT OF LABOUR

The main principle behind the obstetric management of antenatal patients with heart disease is to wait for the spontaneous onset of labour. When the patients go into labour, they were taken care of in propped up position and provided oxygen by mask. Patients were sedated in the latent phase of first stage of labour with an intravenous line. Prophylactic antibiotics were recommended in all these patients. If the patient is on diuretics, digoxin and deriphylline, the drugs are continued or else started as per cardiologists' advice.

Epidural analgesia is given as a routine for all heart disease patients when they enter active phase of first stage of labour and once they enter the second stage of labour, it is cut short by prophylactic outlet forceps delivery with episiotomy. Episiotomies and other perineal lacerations were sutured promptly.

Caesarean section was carried out only for obstetric indications. When the patient is under epidural analgesia, caesarean is performed with epidural top-up. After delivery, for 24 to 48 hours they were monitored for signs of postpartum haemorrhage and decompensation and were kept in Intensive Care Unit. For a minimum of 5 days, patients were kept in ICU and then stepped down to next level of care in labour ward before they were sent to complicated post natal ward.

Neonates were followed up throughout their hospital stay by neonatologist. Breast feeding is recommended all patients except in those with grade IV heart failure.

All patients were counselled regarding the need of contraception and the risk of future pregnancies. Primigravidae were instructed to space their pregnancies for atleast two years and then to complete their family with no delay. Patients who had completed the family and also patients who suffered from severe decompensation in

this pregnancy were effectively counselled to undergo puerperal sterilisation. If the cardiac high for anaesthesia and surgery is high the patient's husband were counselled for vasectomy. Puerperal sterilisation was performed usually 2 weeks after delivery once the symptoms and signs of heart failure had subsided.Copper-T was inserted in the patients who had notcompleted their family. IUCD insertion is carried out under sterile aseptic precautions and a course of antibiotics was given.

OBSERVATION AND RESULTS

The present study was conducted in the INSTITUTE OF OBSTETRICS AND GYNAECOLOGY for a period of 18 months from January-2011 to June- 2012 among the antenatal patients with heart disease. During the study period, total number pregnant patients with heart disease complicating pregnancy who were included in the study were 338 patients. Out of these 338 patients 302 patients delivered and 36 underwent MTP.

TABLE 1

TOTAL NO. OF CARDIAC PATIENTS	TOTAL NO. OF DELIVERIES	TOTAL NO. OF MTP
338	302	36

There were a total of 21,269 deliveries in IOG out of which 302 deliveries were of patients with heart disease.

TABLE 2

TOTAL NO. OF DELIVERIES	HEART DISEASE DELIVERIES	INCIDENCE OF HEART DISEASE
21,269	302	1.41%

DISTRIBUTION OF CASES AS PER PURPOSE OF ADMISSION

TABLE 3

PURPOSE OF ADMISSION	TOTAL NO. OF PATIENTS	PERCENTAGE
DELIVERY	302	89.35%
MTP	36	10.65%

URBAN – RURAL DISTRIBUTION

The distribution of the patients according to their residential address was studied. 64.8% were from urban areas and 35.2% were from rural areas.

TABLE 4

TOTAL NO. OF PATIENTS	NO.OF PATIENTS FROM URBAN AREAS	INCIDENCE
338	219	64.8%

TABLE 5

TOTAL NO. OF PATIENTS	NO. OF PATIENTS FROM RURAL AREAS	INCIDENCE
338	119	35.2%

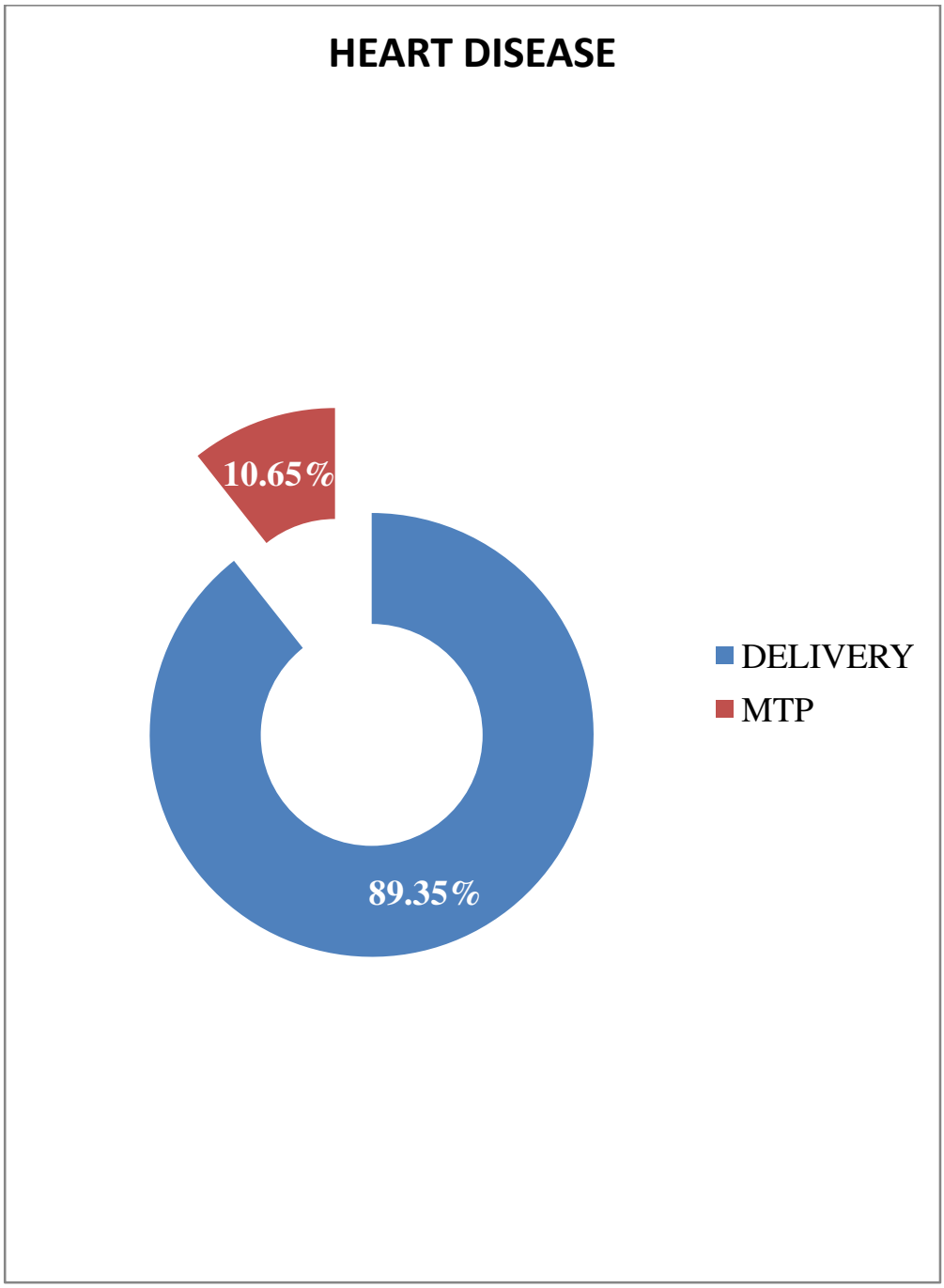


DIAGRAM 1: DISTRIBUTION ACCORDING TO PURPOSE OF ADMISSION

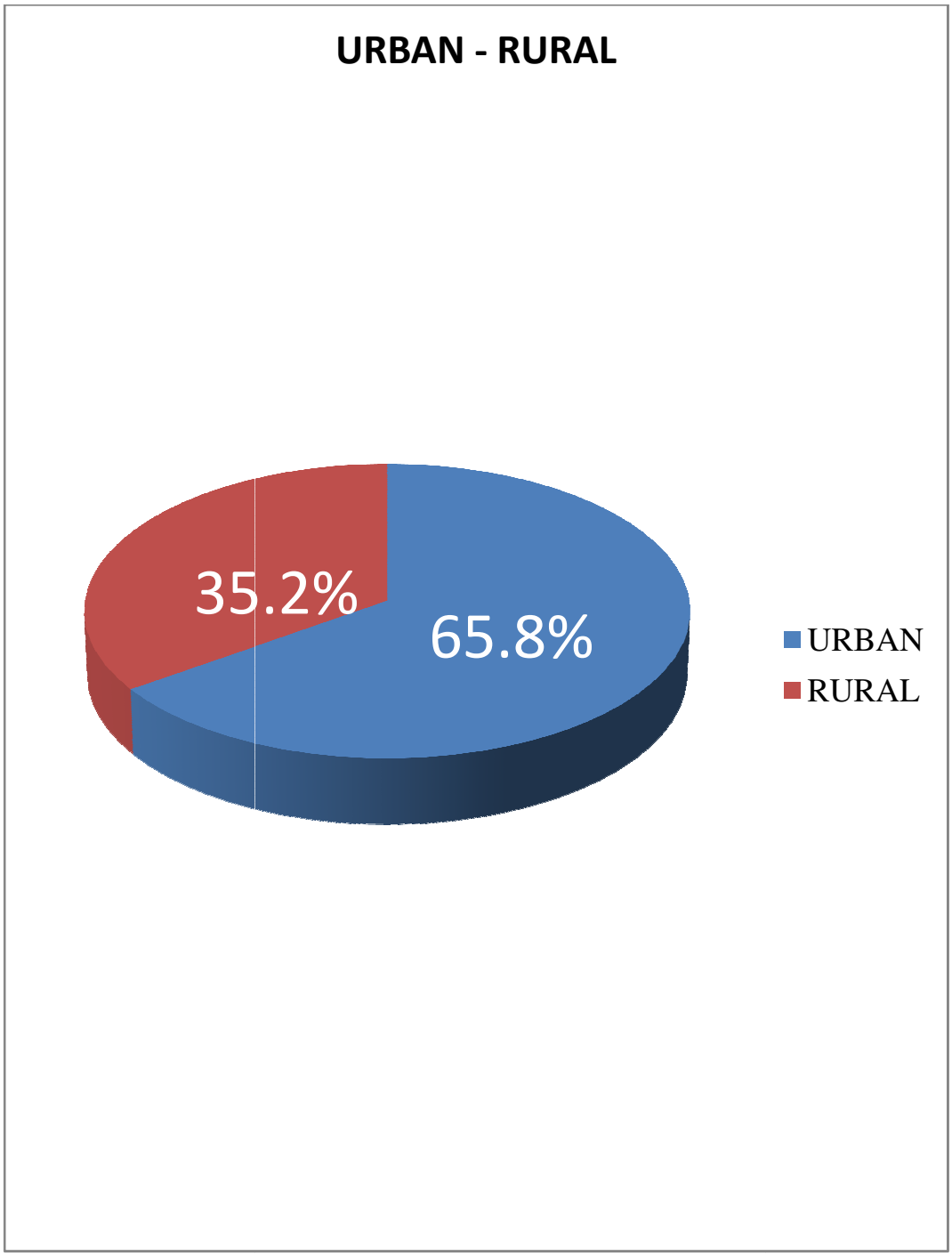


DIAGRAM 2: URBAN – RURAL DISTRIBUTION

SOCIO-ECONOMIC STATUS DISTRIBUTION

TABLE 6

SOCIO ECONOMIC CLASS	NO.OF CASES	PERCENTAGE
I	0	0
II	1	0.3%
III	37	10.94%
IV	165	48.82%
V	135	39.94%
TOTAL	338	100%

BOOKED STATUS

302 patients were admitted for safe confinement. Out of the total 302 cases, 290 (96.03%) cases were booked cases and 12 cases (3.97%) were unbooked cases. All the unbooked cases were multigravida and 4 of them were diagnosed to have heart disease only in this pregnancy

All the unbooked cases were multigravida and 4 of them were diagnosed to have heart disease only in this pregnancy. One patient

was a grand multigravida who is G8P5L5A2 who is a construction site worker and was diagnosed to have severe MSwith moderate pulmonary hypertension only in this pregnancy and was referred to our institute.

3 patients were in congestive cardiac failure at the time of admission and 2 out of 3 these developed atrial fibrillation.in one of these patients Lower respiratory tract infection was the precipitating factor for heart disease. All were treated with anti-failure drugs. One neonate was admitted in neonatal intensive care unit for respiratory distress syndrome. There was no maternal or perinatal mortality among the unbooked cases .

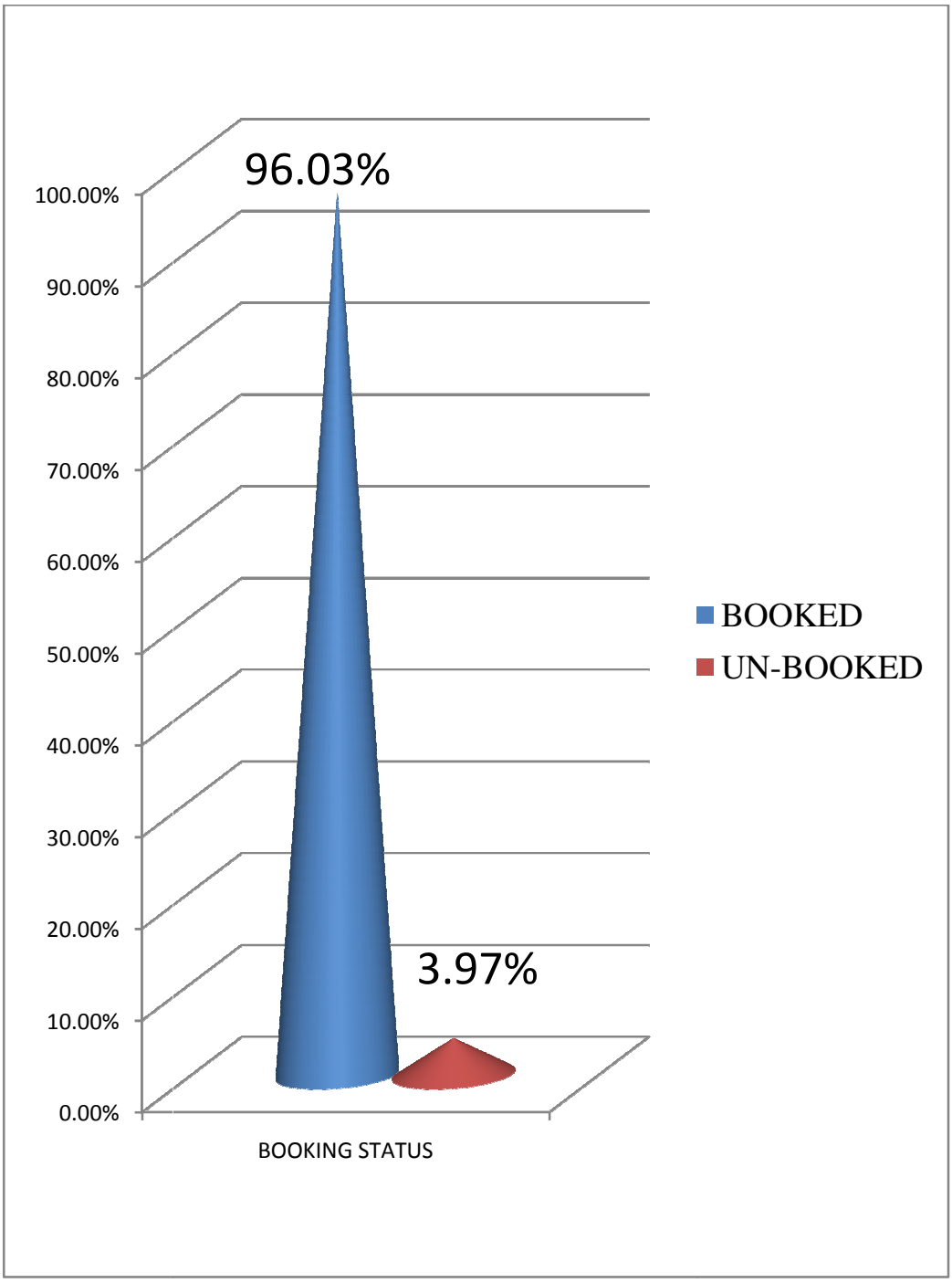


DIAGRAM 3: BOOKING STATUS

AGE DISTRIBUTION - TABLE 7

AGE (YEARS)	NO. OF CASES	PERCENTAGE
≤ 19	15	4.44%
20-24	173	51.18%
25-29	119	35.20%
30-34	18	5.33%
≥ 35	13	3.85%
TOTAL	338	100%

PARITY WISE DISTRIBUTION - TABLE 8

GRAVIDA	NO. OF CASES	PERCENTAGE
PRIMI	146	43.2%
2nd GRAVIDA	121	35.8%
3rd GRAVIDA	55	16.3%
4th GRAVIDA	10	2.9%
GRAND MULTIGRAVIDA	6	1.8%
TOTAL	338	100%

DIAGNOSIS OF HEART DISEASE

Among the study group, 22.78% of the heart diseases were diagnosed for the first time in pregnancy and 77.22% of the patients were already diagnosed to have heart diseases before pregnancy. Out of the 22.78% of the patients diagnosed in this pregnancy 40% were diagnosed only they were evaluated for cardiac symptoms and 60% were diagnosed during the routine echocardiogram done in the antenatal patients.

The practice of obtaining a cardiologist opinion for all the antenatal patients is now being followed in the Government heath posts and the Government corporation hospitals in and around Chennai. And because of this many patients with MVPS with or without valvular dysfunction with deterioration in their functional status are being diagnosed during pregnancy.

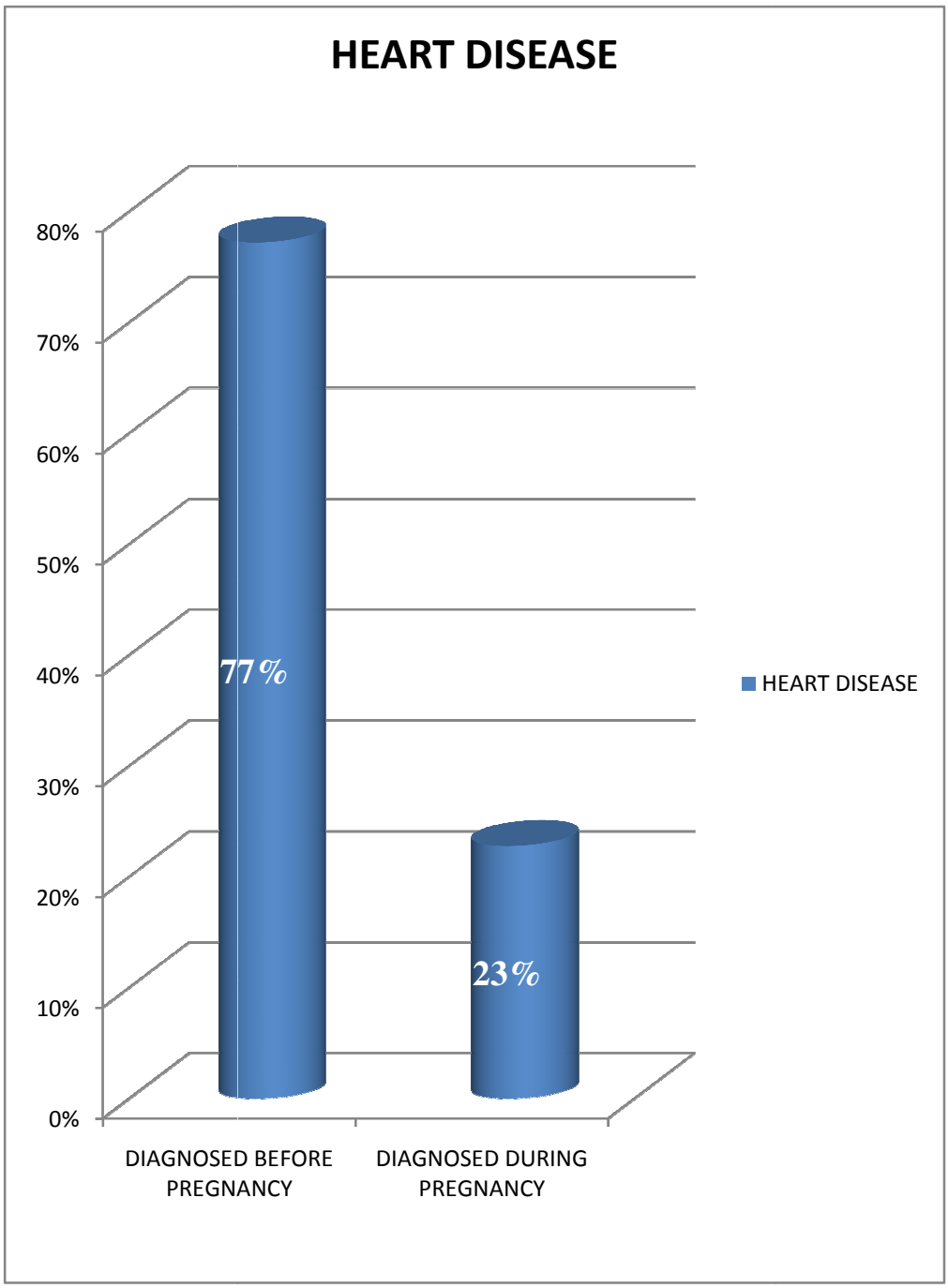


DIAGRAM 4: TIME OF DIAGNOSIS OF HEART DISEASE

DISTRIBUTION OF TYPE OF HEART DISEASE

TABLE 9

TYPE OF HEART DISEASE	NO.OF CASES	PERCENTAGE
RHEUMATIC	165	48.81%
CONGENITAL	99	29.29%
MITRAL VALVE PROLAPSE SYNDROME	52	15.39%
PRIMARY PULMONARY HYPERTENSION	6	1.78%
CARDIOMYOPATHY	9	2.66%
OTHERS	7	2.07%
TOTAL	338	100%

Other types of heart disease include sick sinus syndrome (1case), heart block (4 cases), viral myocarditis (1 case), constrictive pericarditis (1 case).

DISTRIBUTION OF CASES OF RHEUMATIC ETIOLOGY

The following table shows the distribution of the various types of valvular lesions in patients with rheumatic heart disease. 58 patients

had isolated mitral stenosis with or without pulmonary hypertension. 32 patients had isolated mitral regurgitation with or without pulmonary hypertension. 29 patients had mitral stenosis with mitral regurgitation. 39 patients had combined lesions ie.,stenotic and/ or regurgitation of more than one heart valve ie., mitral, aortic, tricuspid and pulmonary. 3 patients had rheumatic aortic stenosis. 2 patients had rheumatic aortic regurgitation. 4 patients had rheumatic aortic stenosis with regurgitation.

TABLE 10

TYPE OF LESION	NO.OF CASES	PERCENTAGE
MS ONLY	58	35.15%
MR ONLY	32	19.39%
MS WITH MR	29	17.59%
MULTIVALVULAR LESIONS	37	22.42%
AS	3	1.82%
AS WITH AR	4	2.42%
AR	2	1.21%

DISTRIBUTION OF CONGENITAL HEART DISEASES

TABLE 11

S.NO.	TYPE OF HEART DISEASE	NO. OF CASES	PERCENTAGE
1	ASD	40	40.41%
2	VSD	18	18.18%
3	PDA	5	5.05%
4	BICUSPID AORTIC VALVE/ AS	2	2.02%
5	PS	3	3.03%
6	TOF	4	4.04%
7	EBSTEIN	1	1.01%
8	ASD & MVPS/ VSD & MVPS	2	2.02%
9	TR	9	9.09%
10	TGA	2	2.02%
11	WPW SYNDROME	2	2.02%
12	DEXTROCARDIA WITH SITUS INVERSUS	1	1.01%
13	COARCTATION OF AORTA	2	2.02%
14	EISENMEMGER SYNDROME	1	1.01%
15	LUTEMBACHER SYNDROME (ASD+MS)	2	2.02%
16	ELLIS-VAN CREVELD SYNDROME	1	1.01%
17	INTER ATRIAL SEPTAL ANEURYSM	4	4.04%

DISTRIBUTION OF MITRAL VALVE PROLAPSE SYNDROME

Distribution of Mitral valve prolapse syndrome and associated pathology is as follows:

TYPE OF MVPS	CASES	PERCENTAGE
NO FUNCTIONAL DERANGEMENT	21	40.39%
MVPS / MR	22	42.30%
MVPS / TR	1	1.92%
MVPS/ MR/ TR	4	7.69%
MVPS / PR	2	3.85%
MVPS/ AR	2	3.85%
TOTAL	52	100%

DISTRIBUTION ACCORDING TO NYHA STATUS

The functional class of the patients according to the NYHA classification is shown in the following table. The classification of the functional status is done at the first time of presentation in our institution.

TABLE 12

FUNCTIONAL CLASS	NO. OF CASES	PERCENTAGE
I	100	29.59%
II	121	35.80%
III	80	23.67%
IV	37	10.94%
TOTAL	338	100%

PREGNANCY OUTCOME IN RARE HEART DISEASE

We had 2 cases of WPW syndrome admitted for safe confinement. One patient was multigravida and delivered by outlet forceps and the other was G2A1 and delivered by emergencyLSCS. There was no maternal or perinatal morbidity or mortality in these patients.

There were 8 cases of cardiomyopathy in the study group. 3 cases of dilated cardiomyopathy, 1 hypertrophic non obstructive cardiomyopathy and 4 peripartum cardiomyopathy cases were in the group. In one case of dilated cardiomyopathy, there was IUD because of severe pre-eclampsia and the pregnancy was terminated. There was

no maternal or foetal complication in hypertrophic cardiomyopathy. Out of the 4 cases of peripartum cardiomyopathy, there was one maternal death and there was no perinatal mortality. One case of dilated cardiomyopathy came for MTP in view of heart disease and the patient had also completed her family.

We had 6 cases of primary pulmonary hypertension during the study period. All cases were booked elsewhere and where referred to IOG in II and III trimesters for further management. All the patients were diagnosed to have primary pulmonary hypertension only after conception. All were primigravida. One patient had twin pregnancy following infertility treatment and she was diagnosed to have pulmonary hypertension only in the29th week of pregnancy and was referred for further management.she developed PPROM in the 35th week and Emergency LSCS was done for fetal distress. Both the babies were admitted in neonatal care unit for respiratory distress and both of them survived.

There were 3 maternal deaths in patients with pulmonary hypertension. 1 out of the 3 patients had associated cirrhosis of liver/ portal hypertension/ HELLP syndrome. The patient died undelivered and post-mortem caesarean section was done immediately but the fetus died in-utero. 2 other patients delivered preterm babies and died

in the immediate postpartum period. One of them delivered a 2.1 kg baby and died on the 1st postnatal day and the other delivered a 0.7 kg fetus and died after 5 hrs. The fetus also expired immediately. Thus primary pulmonary hypertension had 50% mortality in our institute. There were 2 fetaldeath. One was an extreme preterm and other was preterm IUD following maternal death. No other morbidity or mortality was there in these patients.

One case of sick sinus syndrome with permanent pacemaker delivered without any morbidity or mortality. One case of constrictive pericarditis with oesophageal varices who was admitted for safe confinement had a massive hematemesis at 29 weeks of gestation and developed hemorrhagic shock and ultimately death. This patient died undelivered.

There were 2 cases of 1st degree heart block and 2 cases of 2nd degree heart block. One patient had hypothyroidism and one had gestational hypertension and gestational diabetes mellitus. These patients had no maternal or perinatal mortality during pregnancy and delivery. One patient with 3rd degree heart block on pace maker came for MTP and TAT was done in this patient along with MTP.

COMPLICATIONS OF HEART DISEASE

This table depicts the various complications that developed in pregnant patients with heart disease. 19 patients developed congestive cardiac failure, 5 patients had acute pulmonary edema, 4 patients developed atrial fibrillation, 1 patient had embolic manifestation, 2 patients had permanent pacemaker, 2 patients developed supraventricular tachycardia, 1 patient had severe Right ventricular obstruction.

TABLE 13

S. NO.	COMPLICATION	NO.OF CASES	PERCENTAGE
1.	HEART FAILURE	19	54.28%
2.	ACUTE PULMONARY EDEMA	5	14.29%
3.	CCF/ ATRIAL FIBRILLATION	5	14.29%
4.	EMBOLIC MANIFESTATION	1	2.86%
5.	PERMANENT PACEMAKER	2	5.71%
6.	SUPRAVENTRICULAR TACHYCARDIA	2	5.71%
7.	SEVERE RV OUTLET OBSTRUCTION	1	2.86%
8.	TOTAL	35	100%

CO-EXISTENT MEDICAL DISORDERS OR OTHER PREGNANCY RELATED COMPLICATIONS

The table below shows the various pregnancy related complications. 6 patients had anemia, 7 had gestational hypertension, 3 patients had pre-eclampsia, 3 patients had gestational diabetes, bronchial asthma, 3 patients were Rh- Negative, 1 case had previous history of cerebro vascular accident, 3 patients had lower respiratory tract infection, 2 patients were deaf & mute, 3 patients had hypothyroid, 1 case was hyperthyroid, 1 patient had epilepsy, 1 had fever,1 was H_1N_1 positive, 1 was HB_SAg positive, 1 had chicken pox with viral myocarditis, 1 had urinary tract infection, 1 had oesophageal varices.

Few patients had more than one complication. GDM with GHT was seen in 2 patients, 1 pre-eclampsia patient developed grade II abruption, 1 patient had GHT with hypothyroidism, 1 had cirrhosis of liver/ portal hypertension with HELLP syndrome, 1 had fever with LRI.

TABLE 14

S.NO.	COMPLICATIONS	NO.OF CASES	PERCENTAGE
1	ANEMIA	6	11.77%
2	GHT	7	13.74%
3	GDM	3	5.88%
4	PRE-ECLAMPSIA	3	5.88%
5	Rh- NEGATIVE	8	15.69%
6	LRI	3	5.88%
7	HYPOTHYROID	3	5.88%
8	DEAF & MUTE	2	3.92%
9	BRONCHIAL ASTHMA	1	1.96%
10	EPILEPSY	1	1.96%
11	CVA	1	1.96%
12	HYPERTHYROID	1	1.96%
13	FEVER	1	1.96%
14	UTI	1	1.96%
15	H_1N_1 POSITIVE	1	1.96%
16	HB_SA_g POSITIVE	1	1.96%
17	CHICKEN POX	1	1.96%
18	OESOPHAGEAL VARICES	1	1.96%
19	GDM & GHT	2	3.92%
20	GHT& HYPOTHYROID	1	1.96%
21	GHT & ABRUPTION	1	1.96%
22	FEVER & LRI	1	1.96%

23	CIRRHOSIS OF LIVER/ PORTAL HYPERTENSION WITH HELLP SYNDROME	1	1.96%
24	TOTAL	51	100%

DISTRIBUTION OF SURGICALLY CORRECTED HEART DISEASES

This table shows various surgical treatment which the patients underwent for the correction of heart disease. 13 patients underwent closed mitral valve commissurotomy (CMC), 1 underwent balloon valvoplasty, ASD closure was done in 18 patients, VSD closure was done in 5 patients, PDA ligation was done in 2 patients, both ASD and VSD closure was done in 2 patients, mitral valve replacement was done in 9 patients, VSD closure with aortic valve replacement was done in 1 patient, 2 patients had permanent pacemakers.

Among the patients with Rheumatic heart disease, mitral valve surgery was the commonest procedure done. CMC was the commonest among the procedures followed by MVR. One patient who underwent CMC had atrial fibrillation before surgery. One patient underwent CMC during term gestation as she had severe mitral stenosis with repeated attacks of acute pulmonary edema.

TABLE 15

S.NO.	SURGERY	NO.OF CASES	PERCENTAGE
1.	Closed Mitral Valve Commissurotomy	14	25%
2.	Balloon valvoplasty	1	1.78%
3.	ASD closure	18	32.15%
4.	VSD closure	5	8.93%
5.	PDA ligation	2	3.57%
6.	Mitral valve replacement	9	16.08%
7.	ASD & VSD closure	2	3.57%
8.	VSD closure with Aortic valve replacement	1	1.78%
9.	Pace maker	2	3.57%
10.	TGA CORRECTED	2	3.57%
11.	TOTAL	54	100%

Patient was hemodynamically stable during and after the procedure and during labour and delivery. She underwent emergency LSCS for fetal distress. One patient who underwent MVR had atrial fibrillation before procedure.

Out of the 14 patients who underwent CMC, one patient underwent MTP as she had completed family and 3 patients underwent MTP as CMC was planned in these patients.

Out of the 9 patients who underwent MVR, 3 patients underwent MTP and 2 of these patients underwent MTP as MVR was planned in these patients.

Most of the patients who underwent mitral valve surgery, were in NYHA class I or II. Following the surgical correction,these patients less frequently required anti-failure treatment and the maternal and perinatal outcome was good in these patients.

Surgical correction of congenital heart disease was the most common procedure in study group especially ASD closure was the commonest procedure among the study group. One patient had UTI, one had hypothyroidism.

Of the patients with corrected TGA, 1 delivered a preterm baby which died after 5 days due to respiratory distress. Manual removal of placenta was done in the same patient.

VSD closure was done in 5 patients. There was no complication among these patients during pregnancy.

One patient sick sinus syndrome had permanent pacemaker and it was before pregnancy. She had no complication during pregnancy, labour and delivery.

The maternal and foetal outcome was favourable in all the surgically treated patients. Except for one preterm death, there was no other maternal or foetal death. All these patients were hemodynamically stable during pregnancy, labour, delivery and puerperium.

DISTRIBUTION OF CASES ACCORDING TO THE PURPOSE OF ADMISSION

TABLE 16

S.NO.	PURPOSE OF ADMISSION	NO. OF CASES	PERCENTAGE
1.	SAFE CONFINEMENT	302	89.35%
2	MTP	36	10.65%
3	TOTAL	338	100%

Among the heart disease patients under study, 302 were admitted for safe confinement and 36 patients were admitted for MTP.

PREGNANCY OUTCOME IN PATIENTS ADMITTED FOR SAFE CONFINEMENT

TABLE 17

PREGNANCY OUTCOME	NO.OF CASES	PERCENTAGE
VAGINAL DELIVERY	182	60.27%
CAESARIAN SECTION	119	39.40%
DIED UNDELIVERED	1	0.33%
TOTAL	302	100%

Among the 302 patients, 182 patients delivered by vaginal route and 119 patients delivered by caesarean section and one patient died undelivered.

DISTRIBUTION OF VAGINAL DELIVERY

This table shows split up of deliveries that occurred by vaginal route. 50 patients had normal vaginal delivery. 120 delivered by outlet forceps with episiotomy, 7 patients had vacuum extraction with episiotomy,1 case of assisted breech delivery, 2 cases of VBAC- out of which one was a normal vaginal delivery and the other was an assisted breech delivery, and 2 spontaneous expulsion of dead foetus with placenta and membranes in toto.

TABLE 18

S.NO	TYPE OF DELIVERY	NO. OF CASES	PERCENTAGE
1	LABOUR NATURALIS	50	27.27%
2	OUTLET FORCEPS DELIVERY	120	66.37%
3	VACUUM EXTRACTION	7	3.64%
4	ASSISSTED BREECH DELIVERY	1	0.54%
5	VBAC	2	1.09%
6	SPONTANEOUS EXPULSION OF DEAD FETUS	2	1.09%
6	TOTAL	182	100%

DISTRIBUTION OF LABOUR NATURALIS

TABLE 19

S.NO.	TYPE OF DELIVERY	NO. OF CASES	PERCENTAGE
1	LABOUR NATURALIS	5	10%
2	LABOUR NATURALIS / LACERATED PERINEUM	6	12%
3	LABOUR NATURALIS/ EPISIOTOMY	39	78%
4	TOTAL	50	100%

DISTRIBUTION OF CAESAREAN SECTION

Out of the 119 caesarean section done, the following table shows the distribution of cases. All caesarean sections were done for obstetric indication out of which 92 were Emergency caesarean sections and 27 were Elective caesarean sections.

TABLE 20

CAESAREAN SECTION	TYPE	CASES	PERCENTAGE
EMERGENCY CAESAREAN	PRIMARY	72	60.50%
	REPEAT	20	16.81%
ELECTIVE CAESAREAN	PRIMARY	4	3.36%
	REPEAT	23	19.33%
TOTAL	-	119	100%

63.86% were primary section and 36.14% were repeat caesarean section.

INDICATIONS FOR CAESAREAN SECTION

PRIMARY ELECTIVE CAESAREAN SECTION

Indications for primary elective caesarean section are shown in the diagram5.

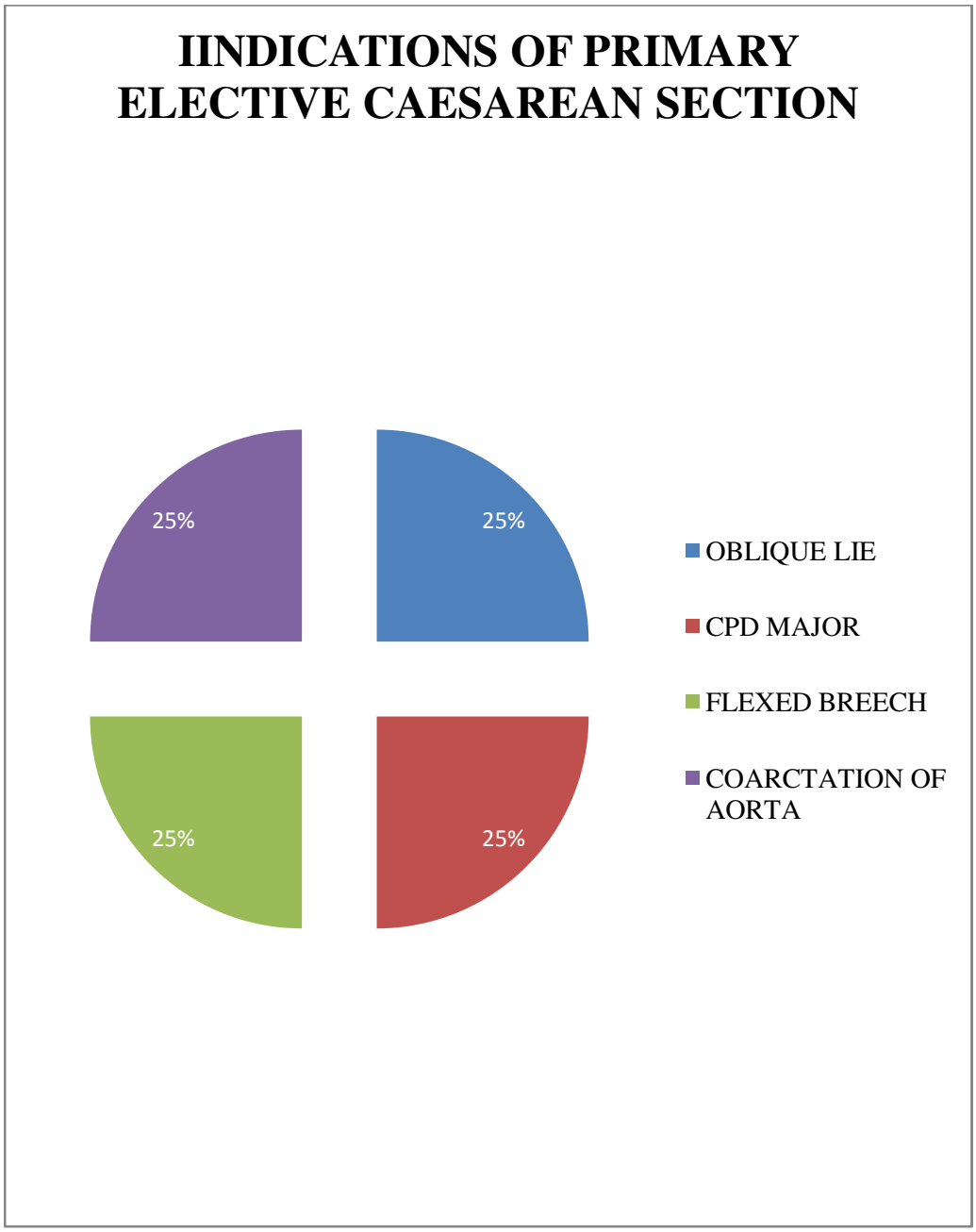


DIAGRAM 5: INDICATIONS OF ELECTIVE PRIMARY CAESAREAN SECTION

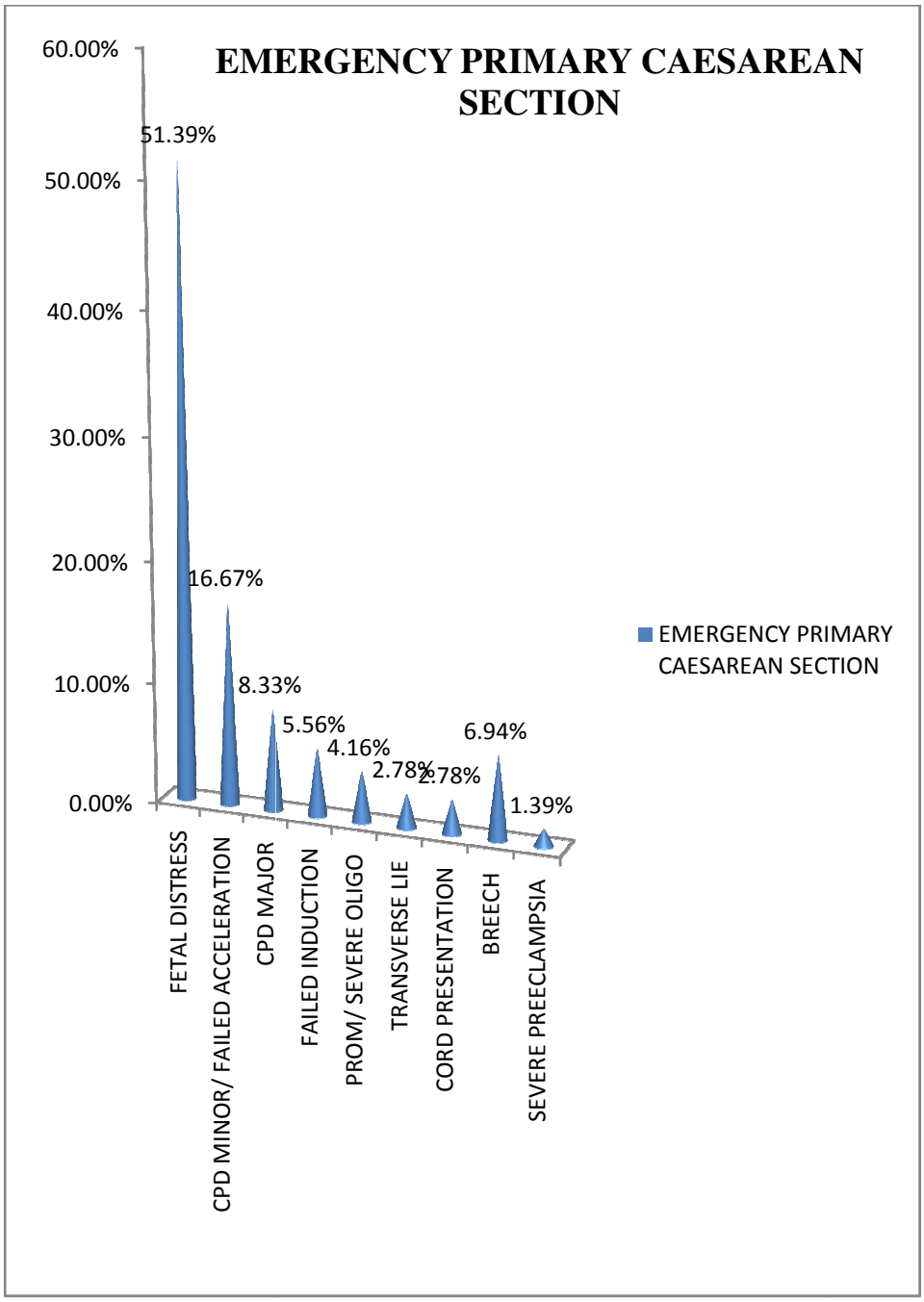


DIAGRAM 6: INDICATIONS FOR EMERGENCY PRIMARY CAESAREAN SECTION

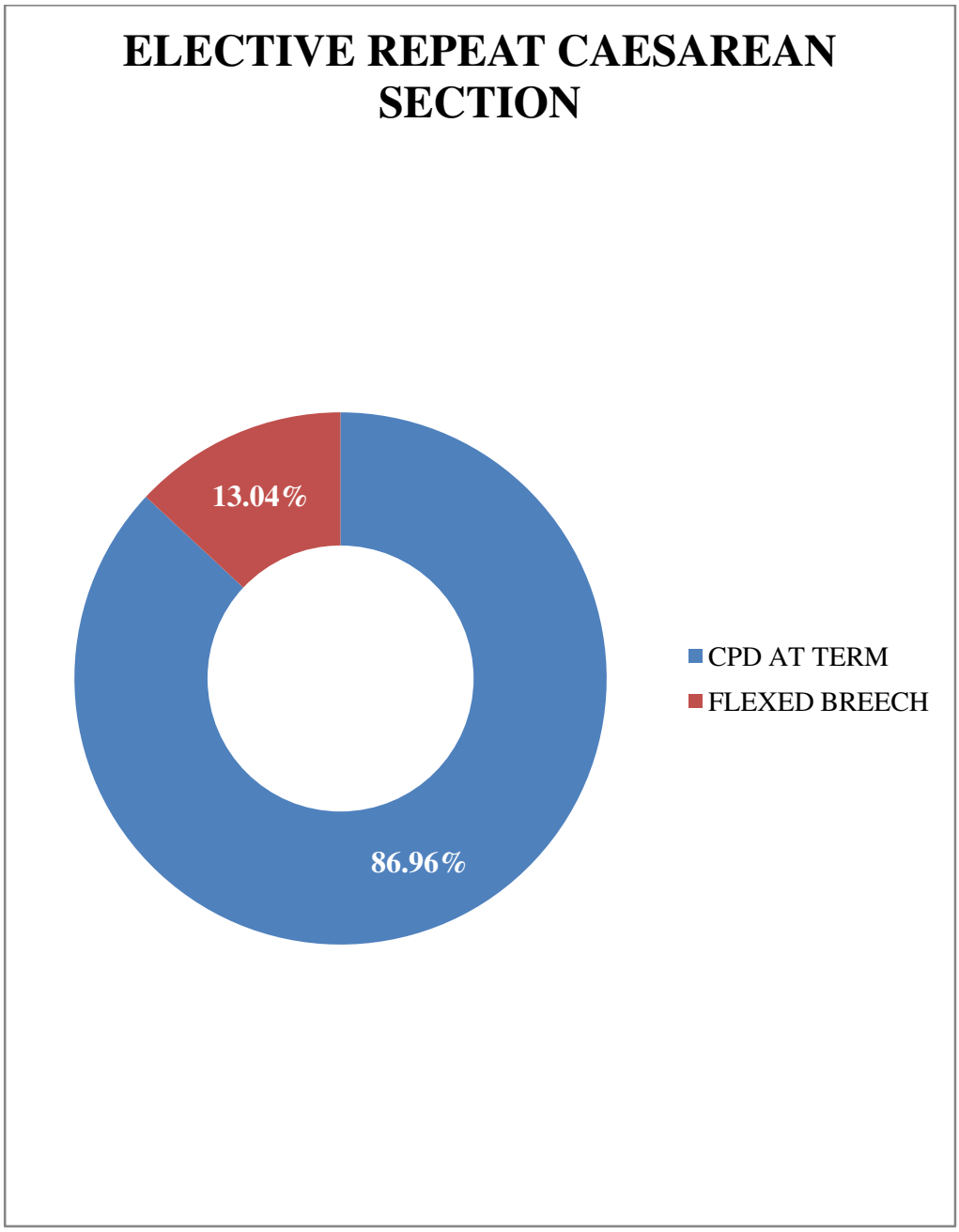


DIAGRAM 7: INDICATIONS FOR ELECTIVE REPEAT CAESAREAN SECTION

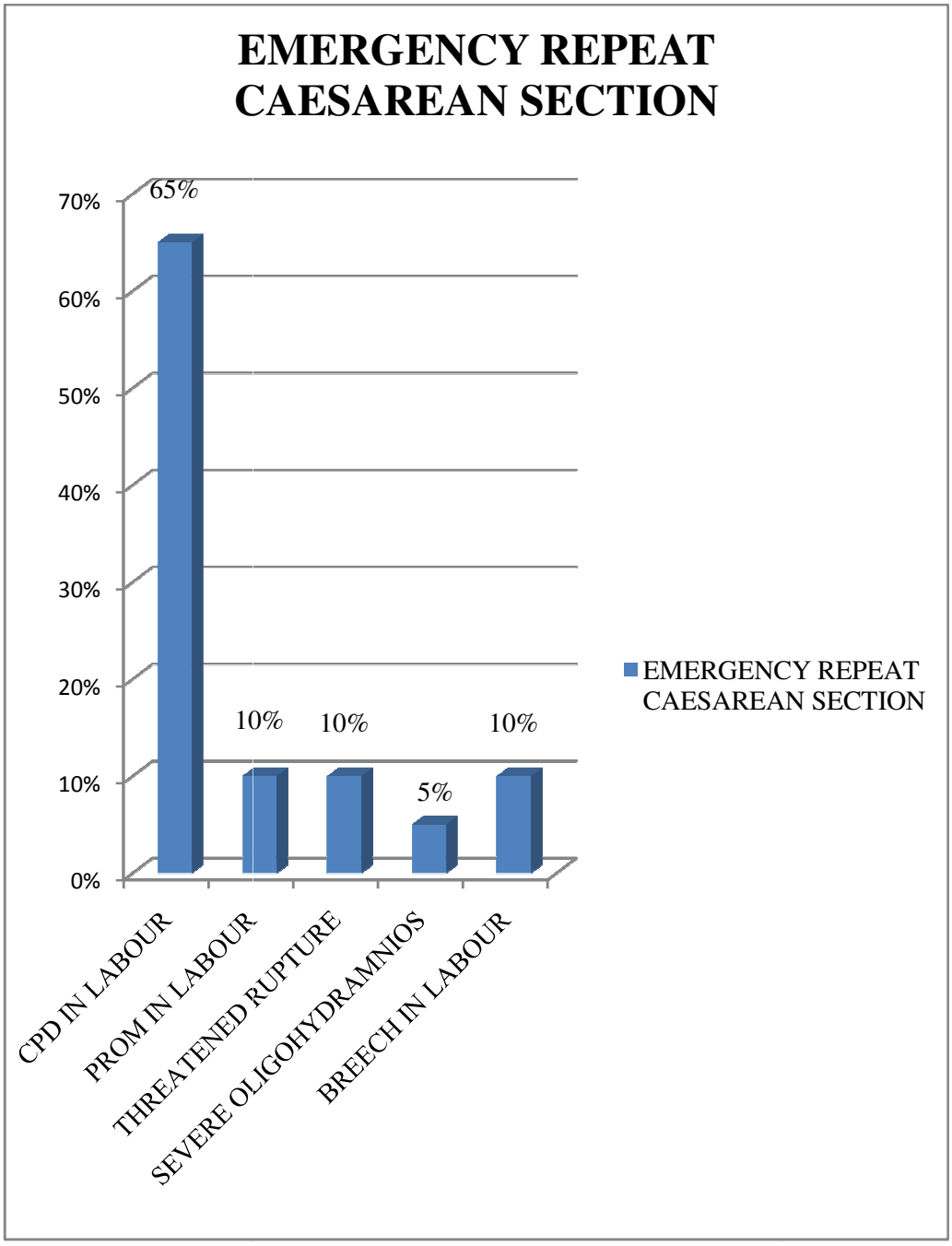


DIAGRAM 8: INDICATIONS FOR EMERGENCY REPEAT CAESAREAN SECTION

EMERGENCY PRIMARY CAESAREAN SECTION

Indications for emergency primary caesarean section are shown in the diagram 6.

2 of the caesarean section done for foetal distress were twins

ELECTIVE REPEAT CAESAREAN SECTION

Indications for elective repeat caesarean section are shown in the diagram 7.

EMERGENCY REPEAT CAESAREAN SECTION

Indications for emergency repeat caesarean sections are shown in the diagram 8.

Out of the 2 caesarean done for breech one was a twin pregnancy with 1st twin in breech presentation. Out of the CPD cases in labour, one case was a grade II abruption with IUD.

DISTRIBUTION OF BIRTH WEIGHT

The following table shows the distribution of birth weight of the babies delivered. 304 babies were delivered by the 301 patients with heart disease, of which 3 were twin deliveries. Birth weight of 13 babies were ≤1.5 kilo, weight of 20 babies were between 1.51 – 2 kilos, 89 babies were between 2.01 – 2.5 kilos, weight of 125 babies was between 2.51 – 3 kilos, 49 babies were between 3.01 – 3.5 kilos and 8 babies were above 3.51 kilos.

TABLE 21

BIRTH WEIGHT (in Kg)	CASES	PERCENTAGE
≤ 1.5	13	4.27%
1.51- 2	20	6.58%
2.01 – 2.5	89	29.28%
2.51 – 3	125	41.12%
3.01 – 3.5	49	16.12%
≥3.51	8	2.63%
TOTAL	304	100%

DISTRIBUTION ACCORDING TO MATURITY OF BABIES

Out of the 304 babies delivered, 31 babies were preterm and 273 babies were term babies. There was no evidence of congenital heart disease in the babies born to the mothers with congenital heart disease. Out of the 31 preterm babies 2 were extreme preterm and delivered as spontaneous expulsion with placenta and membranes in toto.

TABLE 22

MATURITY	NO. OF CASES	PERCENTAGE
TERM	274	90.13%
PRETERM	30	9.87%
TOTAL	304	100%

DISTRIBUTION OF TWIN DELIVERIES

3 set of twins were in the study group. Babies born out of 2 twin deliveries were preterm and one twin delivery was term. All deliveries were caesarean section. 2 were Emergency LSCS and 1 was Emergency repeat LSCS. One patient had primary pulmonary hypertension, and 2 patients had rheumatic mitral stenosis.

All the four preterm twins required admission into the neonatal unit and there was no perinatal mortality among the twin babies. 2 of the patients with twin pregnancies had NYHA status II and one patient's NYHA status was class IV. There was no maternal mortality among the patients with twin pregnancy.

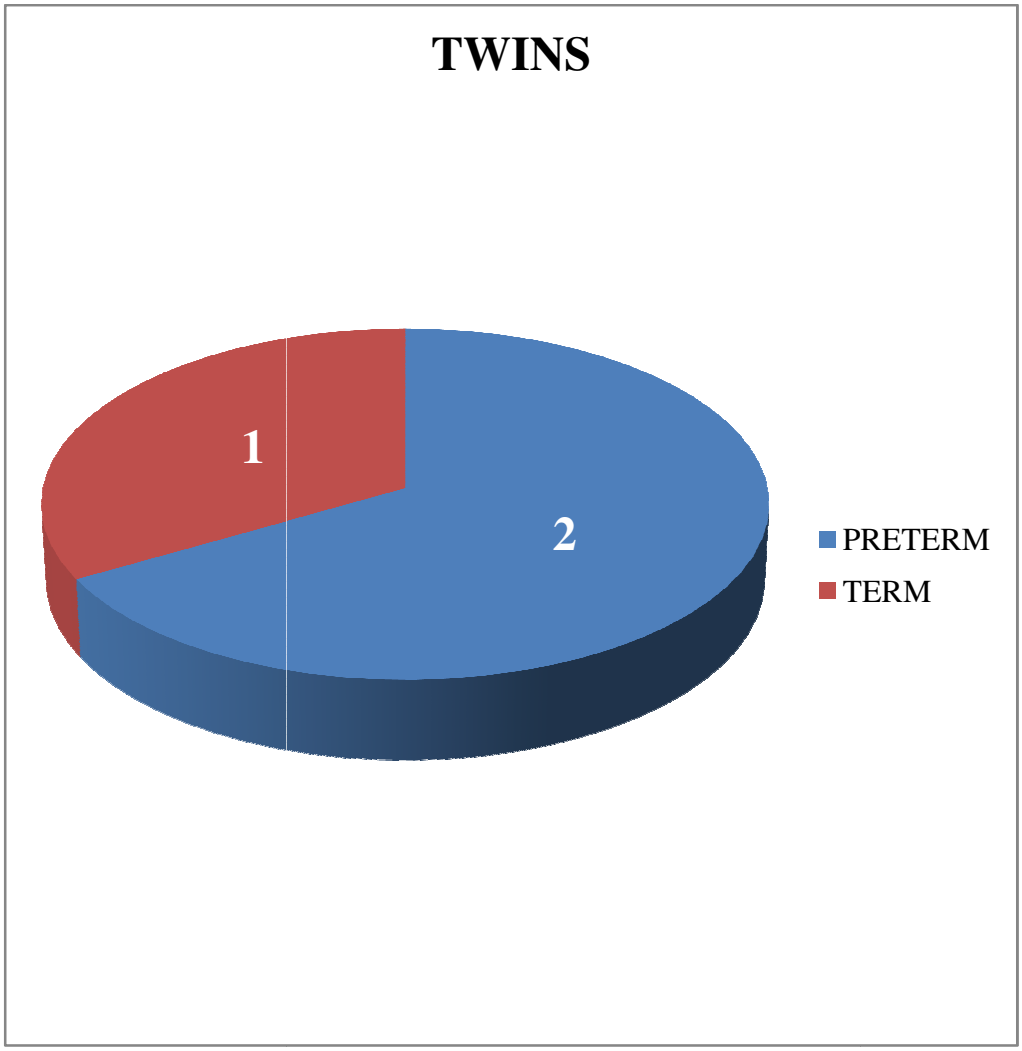


DIAGRAM 9: DISTRIBUTION OF TWIN DELIVERIES

DISTRIBUTION OF PERINATAL DEATH

Reasons for perinatal mortality was respiratory distress syndrome in 3 preterm babies, prematurity in 3 babies, and severe IUGR and birth asphyxia in one term baby. Perinatal mortality is 2.3% in the study.

DISTRIBUTION OF PERINATAL MORBIDITY

Out of 297 live born babies, 26 babies required admission into the neonatal intensive care unit. 16 admissions were due to respiratory distress, 2 were due to IUGR, 1 was due to meconium aspiration, 3 admissions were due to SGA, 4 admissions were for neonatal care as the mothers had cardiac complications.

TABLE 23

PURPOSE OF ADMISSION	NO. OF CASES	NO. OF DEATHS
RDS	16	3
IUGR	2	-
MECONIUM ASPIRATION	1	-
SGA	3	-
MATERNAL COMPLICATION	4	-

Out of the 26 admissions, 3 babies expired in the early neonatal period due to respiratory distress syndrome.

CONTRACEPTION

The following table shows the different methods of contraception- both temporary and permanent among the 338 patients included in the study.

Some method of contraception was used in 304 patients either temporary or permanent. No contraception was used in 34 patients due to some maternal or fetal complication.

The distribution is as follows:

169 Copper-T insertions were done which included both post-placental and interval copper- T insertions, 59 patients underwent puerperal sterilisation,46 had concurrent sterilisation with caesarean section, 30 patients had concurrent sterilisation with MTP.Out of the 169 copper –T insertions, 163 were following deliveries and 6 were following MTP.

TABLE 24

CONTRACEPTION	NO. OF CASES	PERCENTAGE
COPPER-T	169	55.6%
PUERPERAL STERILISATION	59	19.41%
LSCS with STERILISATION	46	15.13%
MTP with STERILISATION	30	9.86%
TOTAL	304	100%

DISTRIBUTION OF PERMANENT METHODS OF CONTRACEPTION

TABLE 25

METHODS	NO. OF CASES	PERCENTAGE
PUERPERAL STERILISATION	59	43.7%
LSCS with STERILISATION	46	34.08%
MTP with STERILISATION	30	22.22%
TOTAL	135	100%

59 patients underwent puerperal sterilisation following vaginal deliveries. 46 patients underwent concurrent sterilisation with LSCS.

Out of the 338 patients, 39.94% of the patients adopted a permanent method of sterilisation.

DISTRIBUTION FO PATIENTS ADMITTED FOR MTP

TABLE 26

TRIMESTER OF MTP	NO. OF CASES	PERCENTAGE
I TRIMESTER	35	97.22%
II TRIMESTER	1	2.78%
TOTAL	36	100%

Only one MTP was done in the II trimester and 35 were done in the I trimester.

DISTRIBUTION OF MTP ACCORDING TO THE SIZE OF THE FAMILY

MTP was done in one primigravida because of Eisenmenger's syndrome[59]. 15 patients had one live child and 20 patients had completed their family with 2 or more live children.

TABLE 27

FAMILY SIZE	NO. OF CASES	PERCENTAGE
NO LIVE CHILD	1	2.78%
ONE LIVE CHILD	15	41.67%
TWO OR MORE LIVE CHILDREN	20	55.55%

DISTRIBUTION OF USE OF CONTRACEPTION FOLLOWING MTP

TABLE 28

S. NO.	TYPE OF CONTRACEPTION	NO. OF CASES	PERCENTAGE
1	COPPER- T	6	16.67%
2	TUBECTOMY	30	83.33%
4	TOTAL	36	100%

Out of the 36 patients admitted for MTP, 14 patients underwent MTP as they had completed their family, 19 patients underwent MTP as it was indicated because their heart disease and 3 patients

underwent MTP as a cardiac corrective surgery had been planned and MTP was done as per cardiologist's advice. As mentioned in the table, 30 patients underwent tubectomy, 6 patients had copper-T insertion following MTP. All patients were stable during the procedure and after the procedure and discharged without any complication.

All first trimester MTPs were done by manual vacuum aspiration using an MVA syringe. Second trimester MTP was done in only one patient because of her cardiac condition.

ANALYSIS OF DEATH IN PREGNANT PATIENTS WITH HEART DISEASE

There were 14 deaths among the total 338 patients studied. 1patient died undelivered at 30 weeks of pregnancy. In one patient post-mortem caesarean was done but the baby also died in-utero.

Cause of death was cardio respiratory arrest in 5 cases, pulmonary oedema in 6 cases, haemorrhagic shock in 2 cases, and pulmonary embolism in 1 patient.

All cases had been booked elsewhere and they were referred to IOG for further management in a serious condition.Functional status of 11 patients was class IV at the time of admission and class II for one patient and class I for one patient.

2 patients had associated cirrhosis of liver with oesophageal varices, one patient had chicken pox complicated by viral myocarditis, one was H_1N_1 positive, 1 patient had pre- eclampsia as coexisting medical disorders.11 patients were diagnosed to have heart disease before pregnancy and one patient developed viral myocarditis and one developed peripartum cardiomyopathy.

9 cases were on anti-failure drugs and despite treatment the condition deteriorated. In 2 cases there was massive variceal bleeding leading to acute decompensation because of hypovolemia. In one patient there was chicken pox in the last week of pregnancy and patient developed viral myocarditis and went into sudden cardio respiratory arrest on the day of delivery.

One patient with critical mitral stenosis acquired H_1N_1 infection which proved to be fatal in her on the 7^{th} post natal day. One patient died on 4^{th} post natal day due to atrial fibrillation. All other patients developed decompensation in the immediate postpartum period and collapsed and they could not be revived.

4 patients had severe to critical mitral stenosis, 3 had primary pulmonary hypertension, one had large perimembranous VSD, one had MVPA of anterior mitral valve leaflet, one had constrictive

pericarditis, one had ASD, one had peripartum cardiomyopathy, and one had viral myocarditis.

No patient had undergone any surgical correction of heart disease before pregnancy.11 patients were less than 30 years and 2 patients were above 30 years. There was IUD in 4 cases and subsequentperinatal mortality in 3 cases and 6 neonates survived after maternal death.

DISCUSSION

INCIDENCE

In our study, the incidence of heart disease among the pregnant patients presented to IOG was 1.41%. it is comparable and is similar to the incidence reported by various other authors in their study.

AUTHOR	YEAR	INCIDENCE
MUDALIAR- MENON[60]	1972	0.97%
CHIA[61]	1998	0.7%
DeSWIET& FIDDLE[62]	1999	0.5%
WILLIAMS[63]	2001	1%
IOG STUDY	2011	1.41%

SOCIO ECONOMIC STATUS

The prognosis of the patient with heart disease is influenced by their socio economic status. 88.76% of the patients included in our study were class IV and V. Comorbid conditions like anemia, infection and heart failure is more in the low socio economic status and these in turn complicate the pregnancy affecting the maternal and fetal outcome in a significant manner.nafeesa and associates published

a report in 1985 stating that 92% in their study group belonged to class IV and V.About 65.8% of the study group patients were from overcrowded urban areas in and around Chennai. 35.2% patients are from the rural areas of Tamilnadu.

ANTENATAL CARE:

In the study group, 3.97% patients were unbooked and 96.03% were booked. Majority of the study (96.03%) was booked either in IOG or elsewhere. Most of the patients with class IV NYHA status were booked elsewhere and were referred to IOG at a late stage for institutional management. All the unbooked cases were multigravida and 4 of them were diagnosed to have heart disease only in this pregnancy. There was no maternal or perinatal mortality among the unbooked.

22.78% of the heart disease patients in the study group were diagnosed to have heart disease only during this pregnancy and 77.22% were diagnosed before this pregnancy. Patients with regular routine antenatal check-up generally had a good maternal and perinatal outcome.

AGE AND PARITY

Mudaliar and Menon in their study stated that in patients with Rheumatic Heart Disease the cardiac condition worsens with time preferably due to the progressive nature of the organic lesion and rather than the increasing parity of the patient.

Among the study group, 90.82% of the cardiac patients were below 30 years of age. Though there is a consensus that, the younger the age the better is the prognosis of the patient, it also depends on the functional status of the patient.

In a report published by Dr.LalithaSubramaniam, 20.5% patients with heart disease were grand multigravida whereas in the present study, the grand multigravida accounted for 1.8% of the study group and this illustrates the betterment in the knowledge regarding the risk of pregnancy among the patients with heart disease and increase in the awareness about various sterilisation methods for limiting the family size.

TYPE OF HEART DISEASE

In the various studies conducted by Mudaliar and Menon (1972) Kamala Sidkar(1980), the incidence of rheumatic heart disease among

the pregnant cardiac patients is 90 – 96%. The studies published in western countries by Tan and De Swiet in 1998 stated that the incidence of rheumatic heart disease is 12%. Chia in 1998 gave a report that the incidence of rheumatic heart disease is 61.6% and the incidence of congenital heart disease is 38.4%

In our present study, 48.81% of the patients had heart disease of rheumatic origin. 29.29% patients had congenital heart disease. Mitral valve prolapse was diagnosed in 15.39%. 1.78% patients had primary pulmonary hypertension, 2.66% had cardiomyopathy. Sick sinus syndrome was diagnosed in one patient, heart block in 4 patients, and viral myocarditis in one case.

RHEUMATIC HEART DISEASE

According to Szekely and Snaith, the distribution is as follows: dominant mitral stenosis lesion is seen in 90%, mitral regurgitation in 6.6%, aortic stenosis in 1% and aortic regurgitation is seen in 2.5%.

In contrast to this report, in our study, among the rheumatic heart disease patients, isolated mitral stenosis is seen in 35.15%, isolated mitral regurgitation was seen in 19.39%, 1.21% patients had aortic regurgitation, aortic stenosis was seen in 1.82%, mitral stenosis

with regurgitation was seen in 17.59% and aortic stenosis with regurgitation in 2.42% and 22.42% had multivalvular lesions. The diagnosis of these lesions is very important in management of these patients during labour and delivery. The use of intravenous fluids mitral stenosis has to be restricted whereas in case of aortic stenosis, patient is managed on the wet side.

CONGENITAL HEART DISEASE

The incidence of the congenital heart disease is comparable with the incidence of the congenital heart disease in the general population. In our study, 40.41% had atrial septal defect and all the defects were of the ostium secundum type. 18.18% patients had ventricular septal defect, 5.05% patients had patent ductus arteriosus, 3.03% had pulmonic stenosis, 4.04% had tetralogy of fallot, 9.09% had tricuspid regurgitation and 4.04% had interatrialseptal aneurysm.

Incidence of Wolff Parkinson White syndrome, corrected Transposition of Great Vessels, Coarctation of Aorta, Lutembacher Syndromebicuspid aortic valve with aortic stenosis was 2.02% each. There was one case each of ASD with MVPS, VSD with MVPS, Dextrocardia with situsinversus, Eisenmenger syndrome, and Ellis Van Creveld syndrome.

The maternal and perinatal outcome in these patients was influenced by the functional status of these patients according to the NYHA classification. The outcome was generally good in most of these patients especially in those who had undergone surgical correction of the defects before pregnancy. In one case of Eisenmenger syndrome, pregnancy was terminated at 11 weeks due to poor maternal outcome in these patients.

A rare case of Ellis Van Creveld syndrome at 30 weeks of gestation was referred to our institute. The patient had polydactyly with single atrium with pulmonary hypertension. She was diagnosed to have the cardiac lesion only at 29 weeks of pregnancy. The patient was in cardiac failure at the time of admission and went into spontaneous labour and delivered a dead born male baby and she expired on the 1st postnatal day.

In the patients with cyanotic heart disease, the prognosis is generally considered to be poor. All the cases of Tetralogy of Fallot were of acyanotic type. The inter atrial septal aneurysm was congenital in origin and is associated with atrial septal defect in 2 patients, mitral valve prolapse in 1 patient and tricuspid valve prolapse in 1 patient. There was no thromboembolic event among these

patients. One case of Ebstein's anomaly had a successful pregnancy outcome without any maternal or fetal complication.

Only one maternal death was in the congenital heart disease group. It was a case of large perimembranous VSD with severe secondary pulmonary hypertension. The baby was preterm and expired in 48 hrs. There were 4 neonatal deaths. 3 were preterm infants out of which one was ≤1 kg, all deaths were due to respiratory distress. One was an IUD and the patient delivered vaginally.

3 patients with ASD, 1 with VSD and severe pulmonary hypertension and 1 with PDA came for MTP. And there was no complication in these patients. In one patient with ASD Copper-T was inserted and all others adopted the permanent methods of sterilisation.

MITRAL VALVE PROLAPSE

Mitral valve prolapse syndrome is most often seen in relation to pregnancy as its frequency of occurrence is common in young women (15%).

In the present study, 15.39% of the pregnant patients had mitral valve prolapse syndrome. In most of the cases, mitral valve prolapse was diagnosed during the routine cardiology workup done in the

antenatal patients and the patients were totally asymptomatic. Although it is an incidental finding, patients with this syndrome might develop complications like arrhythmias, subacute bacterial endocarditis or any thromboembolic complication.

In our study, 40.39% of patients diagnosed to mitral valve prolapse had no functional derangement like regurgitation. 42.30% patients had mitral regurgitation, 1.92% had tricuspid regurgitation, 7.69% patients had both Mitral and tricuspid regurgitation, 3.85% had pulmonary regurgitation, and 3.85% had aortic regurgitation. Mitral valve prolapse associated with regurgitant lesions has been found to be a significant risk factor for bacterial endocarditis.

One patient with mitral valve prolapse syndrome along with severe pre-eclampsia/ PPROM/ IUD developed acute pulmonary edema and died on the 1st postnatal day due to pulmonary edema. This implicates that rather than MVPS, the comorbid conditions contribute to the morbidity and mortality.

RARE CARDIAC DISEASES IN PREGNANCY

We had 2 cases of WPW syndrome admitted for safe confinement. One patient was multigravida and delivered by outlet

forceps and the other was G2A1 and delivered by emergency LSCS. There was no maternal or perinatal morbidity or mortality in these patients.

There were 8 cases of cardiomyopathy in the study group. 3 cases of dilated cardiomyopathy, 1 hypertrophic non obstructive cardiomyopathy and 4 peripartum cardiomyopathy cases were in the group. In one cse of dilated cardiomyopathy, there was IUD because of severe pre-eclampsia and the pregnancy was terminated. There was no maternal or fetal complication in hypertrophic cardiomyopathy.

Out of the 4 cases of peripartum cardiomyopathy, there was one maternal death and there was no perinatal mortality. One case of dilated cardiomyopathy came for MTP in view of heart disease and the patient had also completed her family.

We had 6 cases of primary pulmonary hypertension during the study period. All cases were booked elsewhere and where referred to IOG in II and III trimesters for further management. All the patients were diagnosed to have primary pulmonary hypertension only after conception. All were primigravida.

One patient had twin pregnancy following infertility treatment and she was diagnosed to have pulmonary hypertension only in the29th week of pregnancy and was referred for further management.she developed PPROM in the 35th week and Emergency LSCS was done for fetal distress. Both the babies were admitted in neonatal care unit for respiratory distress and both of them survived.

There were 3 maternal deaths in patients with pulmonary hypertension. 1 out of the 3 patients had associated cirrhosis of liver/ portal hypertension/ HELLP syndrome. The patient died undelivered and post-mortem caesarean section was done immediately but the fetus died in-utero. 2 other patients delivered preterm babies and died in the immediate postpartum period.

One of them delivered a 2.1 kg baby and died on the 1st postnatal day and the other delivered a 0.7 kg fetus and died after 5 hrs. The fetus also expired immediately. Thus primary pulmonary hypertension had 50% mortality in our institute. There were 2 fetal death. One was an extreme preterm and other was preterm IUD following maternal death. No other morbidity or mortality was there in these patients.

ANALYSIS OF RARE HEART DISEASES

S.NO	NAME	AGE	PARITY	SES	HEART DISEASE TYPE	NYHA STATUS	OUTCOME OF PREGNANCY	B.WT(in KG)	MATURITY	COMPLICATIONS OF HD	MATERNAL COMPLICATION	FETAL COMPLICATION
1	GOWRAMMAL	21	G2A1	IV	WPW SYNDROME	II	EMER.LSCS- FETAL DISTRESS	3.3	T	-	-	-
2	PAPPUTHAI	25	G3P1L1A1	V	WPW SYNDROME	II	OUTLET FORCEPS	3	T	-	-	-
3	LAKSHMI	28	G3P1L1A1	IV	PERIPARTUM CARDIOMYOPATHY	IV	LABOUR NATURALE	2.5	T	CCF	-	-
4	RADHADEVI	30	PRIMI	IV	PERIPARTUM CARDIOMYOPATHY	IV	EMER.LSCS-FETAL DISTRESS	2.7	T	CCF	DEATH	-
5	DEEPA	27	G2P1L1	V	PERIPARTUM CARDIOMYOPATHY	IV	ELECTIVE RPT LSCS- PREV.LSCS/ CPD	3.5	T	CCF	-	-
6	LATHA	25	G2P1L1	V	PERIPARTUM CARDIOMYOPATHY	IV	ELECTIVE RPT LSCS- PREV.LSCS/ CPD	3.75	T	CCF	-	-
7	CHITHRA	23	G2P1L1	IV	DILATED CARDIOMYOPATHY	III	OUTLET FORCEPS	2.4	T	-	-	-
8	UMASHREE	20	G2A1	IV	DILATED CARDIOMYOPATHY	III	OUTLET FORCEPS	2.5	T	-	GDM	-
9	KAVITHA	24	PRIMI	IV	DILATED CARDIOMYOPATHY	IV	SPONTANEOUS EXPULSION	0.9	PT	CCF	PRE ECLAMPSIA/ BRONCHIAL ASTHMA	IUD
10	PAVUN	23	PRIMI	V	EBSTEIN'S ANOMALY	III	EMER.LSCS- FETAL DISTRESS	3	T	-	-	RDS
11	PAVITHRA	20	PRIMI	V	ELLIS VAN CREVELD SYNDROME	IV	LABOUR NATURALE	1	PT	CCF	DEATH	IUD
12	DHANALAKSHMI	25	G2P1L0	V	HYPERTROPHIC NON OBSTRUCTIVE CARDIOMYOPATHY	III	EMER.LSCS- TRANSVERSE LIE	3.25	T	-	-	-
13	REVATHI	22	PRIMI	III	PRIMARY PULMONARY HYPERTENSION	III	EMER.LSCS-FETAL DISTRESS	2.5	T	-	-	-
14	PAPPATHI	28	PRIMI	V	PRIMARY PULMONARY HYPERTENSION	III	OUTLET FORCEPS	2.75	T	-	-	-
15	DURGA	21	PRIMI	IV	PRIMARY PULMONARY HYPERTENSION	IV	SPONTANEOUS EXPULSION	0.7	PT	CCF	DEATH	EXPIRED

ANALYSIS OF RARE HEART DISEASES

16	GEETHA	29	PRIMI	III	PRIMARY PULMONARY HYPERTENSION	IV	POSTMORTEM CAESAREAN	1.4	PT	CCF	CIRRHOSIS OF LIVER/ PORTAL HYPERTENSION/ HELLP SYNDROME/ DEATH	IUD
17	MENAKA	21	PRIMI	V	PRIMARY PULMONARY HYPERTENSION	IV	OUTLET FORCEPS	2.1	T	CCF	DEATH	-
18	NARAYANAMMA	25	PRIMI	IV	PRIMARY PULMONARY HYPERTENSION	IV	EMER.LSCS- TWINS/ FETAL DISTRESS	1.2,1.1	PT,PT	CCF	-	RDS
19	BHAVANI	24	G2P1L1	V	SICK SINUS SYNDROME	III	LABOUR NATURALE	2.6	T	PERMANENT PACEMAKER	-	-
20	KAVITHA	23	PRIMI	V	1ST DEGREE HEART BLOCK	I	OUTLET FORCEPS	2.75	T	-	-	-
21	NAMBEESWARI	24	G3P2L2	V	2nd DEGREE HEART BLOCK	II	OUTLET FORCEPS	2.75	T	-	-	-
22	SARASWATHI	24	G2P1L1	IV	2nd DEGREE HEART BLOCK	III	OUTLET FORCEPS	2.6	T	-	GDM/GHT	RDS
23	NITHYA	23	PRIMI	V	acyanotic TETRALOGY OF FALLOT	III	LABOUR NATURALE	2.5	T	-	-	-
24	SHARMILA	23	PRIMI	IV	ACYANOTIC TETRALOGY OF FALLOT	III	OUTLET FORCEPS	2.2	T	severe RV OUTLET OBSTRUCTION	-	-
25	SANDHYA	19	PRIMI	V	acyanotic TETRALOGY OF FALLOT	III	OUTLET FORCEPS	2.5	T	-	-	-
26	VALARMATHI	23	PRIMI	V	acyanoticTETRALOGY OF FALLOT	III	OUTLET FORCEPS	2.5	T	-	-	-
27	SANGEETHA	28	PRIMI	III	COARCTATION OF AORTA	III	ELECTIVE LSCS-CPD MAJOR/ COARCTATION OF AORTA	2.9	T	-	-	-
28	PARAMESWARI	28	PRIMI	IV	COARCTATION OF AORTA	III	ELECTIVE LSCS- COARCTATION OF AORTA	2.25	T	-	-	-
29	NITHYA	21	PRIMI	IV	TGA CORRECTED	II	VACCUM EXTRACTION	2.9	T	-	-	
30	SANGEETHA	25	G2A1	IV	TGA CORRECTED/ small VSD	III	LABOUR NATURALE	1.8	PT	-	PPROM/MANUAL REMOVAL OF PLACENTA	-

One case of sick sinus syndrome with permanent pacemaker delivered without any morbidity or mortality. One case of constrictive pericarditis with oesophageal varices who was admitted for safe confinement had a massive hematemesis at 29 weeks of gestation and developed hemorrhagic shock and ultimately death. This patient died undelivered. There were 2 cases of 1st degree heart block and 2 cases of 2nd degree heart block. One patient had hypothyroidism and one had gestational hypertension and gestational diabetes mellitus. These patients had no maternal or perinatal mortality during pregnancy and delivery. One patient with 3rd degree heart block on pace maker came for MTP and TAT was done in this patient along with MTP. There were 4 cases of Tetralogy of Fallot with no maternal death.1 case of Ellis-van Creveld syndrome was referred at 30 wks of pregnancy and died due to acute pulmonary edema.

COMPLICATIONS OF HEART DISEASE IN PREGNANCY

Among the patients who developed cardiac complications, rheumatic heart disease was the most common underlying heart disease. Various complications seen in the patients with heart disease were acute pulmonary edema, congestive cardiac failure, atrial

HEART DISEASE	NO. OF CASES	NO. OF DEATHS	MORTALITY PERCENTAGE
PERIPARTUM CARDIOMYOPATHY	4	1	25%
PRIMARY PULMONARY HYPERTENSION	6	3	50%
DILATED CARDIOMYOPATHY	3	0	0%
HYPERTROPHIC NONOBSTRUCTIVE CARDIOMYOPATHY	1	0%	
EBSTEIN'S ANOMALY			
ELLIS-VAN CREVELD SYNDROME	1	1	100%
SICK SINUS SYNDROME	1	0	0%
WPW SYNDROME	2	0	0%
HEART BLOCK	4	0	0%
TGA CORRECTED	2	0	0%
TETRALOGY OF FALLOT	4	0	0%

COARCTATION OF AORTA	2	0	0%

fibrillation, supraventricular tachycardia, pulmonary embolism and severe right ventricular outlet obstruction.

CARDIAC FAILURE

In the study group, 37 patients were in class IV NYHA status and 19 patients (5.62%) had cardiac failure at the time of admission. 12 out of 19 patients with failure improved with anti-failure measures and supportive care in the intensive care unit. These patients were managed with expert opinion from the cardiologists and anaesthesiologists.

Development of decompensation in the heart disease patients depends on the functional status of the patient before pregnancy and the hemodynamic burden imposed on the diseased heart by pregnancy.

ATRIAL FIBRILLATION

Szekely and Snaith in 1989 reported that atrial fibrillation increases the risk of thromboembolism and heart failure. Pulmonary edema can develop in pregnancy when atrial fibrillation occurs in patients with mitral stenosis leading to the increase in maternal and

perinatal morbidity and mortality. Atrial fibrillation was seen in 4 pregnancies (1.18%)among the heart disease patients under study. The incidence of atrial fibrillation reported by Szekely and Snaith(1974) was 6.5%.All the 4 patients developed heart failure and among them expired. Others patients recovered from the acute episode and were started on rate control drugs along with anti-failure drugs. These patients were put on anticoagulants until they recovered from the acute episode to prevent the development of thromboembolism as per cardiologist advice.

ACUTE PULMONARY EDEMA

Most common heart disease which developed Pulmonaryedema as a complication was rheumatic mitral stenosis. In our study group, 5 patients (1.47%) developed pulmonary edema. out of these 5 patients, 3 patients had severe mitral stenosis, 1 had critical mitral stenosis and 1 patient had mitral valve prolapse with preeclampsia. In one patient with severe mitral stenosis acute pulmonary edema was precipitated by H1N1 infection.

Pulmonary edema has been the single most important cause of death in patients with heart disease. 4 out of 5 patients with pulmonary edema could not be revived and they succumbed to the disease.

The risk of developing pulmonary edema coincided with period of pregnancy in which there is increased volume expansion and increased hemodynamic overload on the heart. In one patient pulmonary edema occurred in 32 weeks, in 2 patients it occurred near term and in one patient it developed 6 days after delivery. All patients were connected to ventilator with anti-failure measures and inotropic agents as per cardiologist's advice. 4 out of 5 patietns could not be revived and they expired. In cases of severe mitral stenosis, the patients were already on anti-failure drugs and despite these measures they developed pulmonary edema. This emphasises the importance of pre-conceptional counselling and early termination of pregnancy if required when the patient is diagnosed to have a heart disease with poor cardiac reserve, so that death can be prevented in these patients.

SUPRAVENTRICULAR TACHYCARDIA

Supraventricular tachycardia complicated 2 pregnancies with atrial septal defect. Both patients were at term. 1case developed the complication in the antenatal period and the other patient developed it 12 hours after delivery. Inspite of the intensive treatment and the prompt use of drugs, one patient could not be saved.

PULMONARY EMBOLISM

One patient with a large perimembranous VSD developed pulmonary embolism on the 3rd postnatal day and expired. The baby was a preterm and died due to respiratory distress.

SEVERE RIGHT VENTRICULAR OUTLET OBSTRUCTION

One case of acyanotic tetralogy of fallot had severe right ventricular outlet obstruction. Fortunately patient did not develop any complication and was discharged in a stable condition.

COMORBID CONDITIONS

ANAEMIA

In our study 1.77% patients had co-existing anaemia. 6 cases of the 338 patients had anaemia along with heart disease. 5 patients had moderate anaemia and 1 patient had severe anaemia. Improved antenatal care has decreased the incidence of anaemia in the study group. The patient with severe anaemia is an unbooked case. Patients with anaemia in our study belonged to low socio-economic status. Anaemia was linked to various complications like preterm delivery, IUGR, heart failure etc. 2 patients had preterm delivery, 1 patient had

IUGR, and 3 developed heart failure. There was no maternal or perinatal mortality.

GESTATIONAL HYPERTENSION AND PREECLAMPISA

In our study, 10 patients with heart disease had gestational hypertension and 3 patients had pre-eclampsia. The association of pre-eclampsia with heart disease had a poor perinatal outcome due to further compromise in blood flow.

2 patients with pre-eclampsia had IUD and one patient with gestational hypertension developed grade –II abruption and IUD. 2 more babies had respiratory distress but recovered.

RESPIRATORY COMPLICATIONS

4 patients had lower respiratory infection and one had bronchial asthma. 3 patients developed heart failure but there was no maternal death in these patients. There was one IUGR delivery and 3 preterm deliveries among these patients out of which 2 expired. There was one intrauterine death in the patient with bronchial asthma and pre-eclampsia. One patient had fever with LRI and went into labour at 32 weeks. The baby died due to respiratory distress and sepsis. Cardiorespiratory disorder in a heart disease patient further reduced the cardiopulmonary reserve and fetal complications are more due to increased hypoxic stress.

OTHER CONDITIONS

6 patients had gestational diabetes, 6 patients had hypothyroidism, 1 had hyperthyroidism, 1 had epilepsy and 1 had previous history of cerebrovascular accident. 1 case had polyhydramnios, 1 was hepatitis B surface antigen positive, 1 had placenta praevia, 2 had oesophageal varices, 2 had PPROM and 8 had PROM and 1 had UTI.

INFECTIVE ENDOCARDITIS

2 patients in the study group had fever but no case of infective endocarditis was noted in our study group. All patients received antibiotics during parturition and infective endocarditis prophylaxis was given for all patients with valvular lesions with more pressure gradient across the valves.

SURGICALLY CORRECTED CONGENITAL HEART DISEASE

18 patients had undergone ASD closure in the childhood and adolescence period. 4 patients with VSD had undergone closure and in 4 patients PDA ligation was done and TGA was corrected in 2 patients. All these patients had a favourable pregnancy outcome and they were hemodynamically stable during pregnancy, labour, delivery

and puerperium. One patient had a preterm IUD and she delivered vaginally. There was no maternal mortality in this study group.

PURPOSE OF ADMISSION

In our study, 89.34% patients with heart disease were admitted for safe confinement and 10.65% patients were admitted for medical termination of pregnancy.

7 patients were admitted in the II trimester and 1 patient died undelivered. Out of the 7 patients 6 were in heart failure at the time of admission.

2 out of these 6 patients in failure had IUD. One patient was admitted for pre-eclampsia/ bronchial asthma/ IUD and the other had heart failure with IUD.

1 out of the 6 patients in heart failure was an unbooked case/ previous LSCS and she was admitted for severe anaemia in labour and the patient delivered by assisted breech delivery.1 patient had constrictive pericarditis/ oesophageal varices with massive haemorrhage and the patient died undelivered at 29 weeks of pregnancy.

1 out of the 7 patients admitted in second trimester was admitted for PPROM. 4 out of the 7 patients died.

MODE OF DELIVERY

In the study group, among the 302 patients admitted for safe confinement 60.27% had vaginal delivery, 39.4% delivered by caesarean section and 1 patient died undelivered. Caesarean section was done for obstetric reasons and in 2 patients with coarctation of aorta; the heart disease per se was an indication for caesarean section.
In a study published by Dr.K.Sidkar, 92% of the study group delivered vaginally and caesarean section was done in 1.7% and 3.5% patient died undelivered.

In the present study the rate of caesarean sections done had increased but they were done mainly for obstetric indications. 63.86% were primary section and 36.14% were repeat caesarean section.

In our study, 60.27% delivered vaginally and 66.37% were prophylactic outlet forceps delivery. 7 cases of vacuum extraction 1 assisted breech delivery, 2 vaginal births after caesarean and 2 spontaneous expulsion of dead fetus were under the study. Both the cases of VBAC got admitted at in the active phase of I stage of labour. One of them had a labour naturalis and the other had an assisted breech delivery. Copper – T was inserted in both of them as one baby was a preterm and the other was an IUGR baby.

TWIN PREGNANCY OUTCOME IN HEART DISEASE

Twin pregnancy in heart disease predisposes the mother to greater risk of decompensation due to much higher hemodynamic overload in these patients. There were 3 twin pregnancies among the patients studied. 2 out of the 3 pregnancies delivered preterm and one delivered at term. All 3 underwent emergency caesarean section, 2 for fetal distress and for previous LSCS with 1st twin in breech presentation. The two sets of preterm babies were admitted in neonatal care unit due to respiratory distress. Weights of these babies were between 1.1kg and 2.6 kg. There was no maternal or perinatal mortality among these patients. This indicates that if the patient has good pre pregnancy cardiac reserve, the pregnancy will have a favourable maternal and perinatal outcome but the incidence of preterm labour is increased in the study group.

FETAL OUTCOME

Surgne and associates in 1981 proposed that the perinatal outcome in rheumatic heart disease in pregnancy is generally good and comparable to the patients without heart disease.

MATURITY AND BIRTH WEIGHT

In our study 9.87% of the babies were preterm babies and 90.13% were term babies. 3 babies were SGA and 1 was an IUGR baby.

35.86% of the babies had birth weight below 2.5 kg. 57.24% had birth weight between 2.51 – 3.5 kg and 2.63% babies were above 3.51 kg. One baby was 4.1 kg. There were no congenital anomalies or congenital heart disease in the babies born to mothers with congenital heart disease.

Incidence of congenital anomalies among babies born to mother with congenital heart disease in various studies is shown in the following table:

AUTHOR	YEAR	INCIDENCE
Whitemore et al	1982	10%
Shime et al	1987	13%
Perloff	1997	5-10%
Our study	2001	Nil

PERINATAL MORTALITY RATE

There were 8 intra uterine deaths and 7 perinatal deaths out of the 304 babies delivered. Perinatal mortality was seen in 6 preterm babies and 1 term baby accounting for 2.3% of the babies in the study.

Perinatal mortality in various studies on heart disease complicating pregnancy is as follows:

AUTHOR	YEAR	NO.OF CASES	PERINATAL MORTALITY
Beebi et al	1985	500	13.6%
Szekely and Snaith[58]	1977	1000	35%
DipakBabu et al	1995	74	5.4%
Present study	2011	302	2.3%

There is a decline in the perinatal mortality and morbidity with improvement in the antenatal care, prompt diagnosis and treatment of the comorbid conditions and treatment of infection if present, institutional delivery of the patients with heart disease and advancements in neonatal care.

CONTRACEPTION

According to Cheslay in 1978, the severity of rheumatic heart disease increases with age as there is progressive endomyocardial changes in the diseased heart. Hence the patients with rheumatic heart disease are generally advised to complete their family at a younger age

with an inter pregnancy interval of at least 1 to 2 years. This emphasises the counselling of the patient regarding the temporary and permanent methods of contraception. The use of improper contraceptive can be even life threatening in heart disease patients according to Brenner in 1975. Somerville in 1998 stated that patients with heart disease can be treated as any normal pregnant patient with regard to the use of contraceptive.

In our study out of the total 338 patients, 304 patients adopted some form of contraception. Out of the 304 patients, 44.4%patients had undergone permanent sterilisation. All the patients had at least one live child.

Out of the 44.4% patients, 19.41% underwent puerperal sterilisation, 15.13% patients underwent concurrent sterilisation with LSCS and 9.86% under tubectomy following MTP.

MEDICAL TERMINATON OF PREGNANCY

In 97.22% of cases, MTP was done in the I trimester by manual vacuum aspiration. 1 patient underwent II trimester MTP. II trimester MTP was performed using oral mifepristone and vaginal misoprostal without any complication.

Out of the 36 patients admitted for MTP, 14 patients underwent MTP as they had completed their family, 19 heart disease and 3 patients underwent MTP as a cardiac corrective surgery had been planned and MTP was done as per cardiologist's advice

Copper- T was inserted in16.67% patients following MTP. And 83.33% underwent tubectomy.

All patients were stable during the procedure and after the procedure and discharged without any complication.

MATERNAL MORTALITY

According to the functional status of the patient the maternal mortality is as follows:

STUDY	NYHA CLASS I & II	NYHA CLASS III & IV
SULLIVAN (1985)	0.4%	4 -7%
PRESENT STUDY (2011)	0.29%	3.84%

Maternal mortality in relation to heart disease in pregnancy has declined over the past 2 decades. Yet heart disease continues to be an important cause of maternal mortality in developing countries. Case fatality rate of heart disease in the present study is 4.1%. All but one patient were admitted with heart failure.

AUTHOR	YEAR	MATERNAL MORTALITY
Koorin et al	1996	5.6%
Jacob et al	1999	15%
De Swiet	2000	3.8%
Present study	2011	4.1%

The statistics show that the heart disease still contributes significantly to the maternal mortality even in the most developed countries like United States. In the U.S. heart disease continues to be the cause for 10% of maternal death and this rate had remained relatively constant over the past 5 decades according to Eastby (1998).

Case fatality rate of heart disease in pregnancy in the developing countries continues to be high ranging from 3 -6% mainly because of anaemia, lack of prenatal care and emergency admissions.

ANALYSIS OF DEATH CASES

S.No	NAME	AGE	PARITY	BOOKING STATUS	HEART DISEASE TYPE	PURPOSE OF ADMISSION	NYHA STATUS	OUTCOME OF PREGNANCY	B.WT(in KG)	MATURITY	COMPLICATIONS OF HD	MATERNAL COMPLICATION
1	SARASWATHI	23	PRIMI	B	VIRAL MYOCARDITIS	SC	I	LABOUR NATURALE	2.8	T	CCF/ DEATH	CHICKEN POX/ DEATH
2	GEETHA	29	PRIMI	B	PRIMARY PULMONARY HYPERTENSION	SC	IV	POSTMORTEM CAESAREAN	1.4	PT	CCF	CIRRHOSIS OF LIVER/ PORTAL HYPERTENSION/ HELLP SYNDROME/ DEATH
3	RAJALAKSHMI	32	G2P1L0	B	critical MS/ PHT	SC	IV	ELECTIVE RPT LSCS-PREV LSCS/ CPD	2.3	T	ACUTE PULMONARY EDEMA	DEATH
4	KALAIMAGAL	21	PRIMI	B	large perimembranous VSD/ severe PHT	SC	IV	LABOUR NATURALE	1.5	PT	PULMONARY EMBOLISM	DEATH
5	MALAR	32	G3P2L2	B	critical MS/ mild TR/ severe PHT	SC	IV	OUTLET FORCEPS	1.25	T	ATRIAL FIBRILLATION/ CCF	DEATH
6	RADHADEVI	30	PRIMI	B	PERIPARTUM CARDIOMYOPATHY	SC	IV	EMER.LSCS-FETAL DISTRESS	2.7	T	CCF	DEATH
7	DURGA	21	PRIMI	B	PRIMARY PULMONARY HYPERTENSION	SC	IV	SPONTANEOUS EXPULSION	0.7	PT	CCF	DEATH

ANALYSIS OF DEATH CASES

8	USHA	24	G2P1L1	B	ASD	SC	IV	EMER.RPT.LSCS PREV.LSCS/CPD	2.75	T	SUPRAVENTRICULAR TACHYCARDIA	DEATH
9	MENAKA	21	PRIMI	B	PRIMARY PULMONARY HYPERTENSION	SC	IV	OUTLET FORCEPS	2.1	T	CCF	DEATH
10	PAVITHRA	20	PRIMI	B	ELLIS VAN CREVELD SYNDROME	SC	IV	LABOUR NATURALE	1	PT	CCF	DEATH
11	CHANDRIKA	23	PRIMI	B	Moderate to severe MS / severe PHT	SC	IV	LABOUR NATURALE	2.3	T	ACUTE PULMONARY EDEMA	GHT/DEATH
12	POONGODI	22	PRIMI	B	Severe MS / moderate PHT	SC	IV	OUTLET FORCEPS	1.7	PT	ACUTE PULMONARY EDEMA	H1N1 POSITIVE /DEATH
13	VIJAYA	20	PRIMI	B	CONSTRICTIVE PERICARDITIS	SC	IV	UNDELIVERED	-	-	CCF	OESOPHAGEAL VARIES/HEMORRHAGIC SHOCK / DEATH
14	PREETHI	20	G2A1	B	MVPS of AML	SC	IV	VACCUM EXTRACTION	2.3	PT	ACUTE PULMONARY EDEMA	PRE ECLAMPSIA / PPROM/DEATH

SUMMARY

- In the Institute of Obstetrics and Gynaecology, Egmore, Chennai during the study period from January 2011 to June 2012.
- 338 cases of heart disease complicating pregnancy were studied.
- The incidence of heart disease in pregnant patients is 1.41%.
- 64.8% from overcrowded areas of urban Chennai.
- 35.2% of the patients came from a rural background.
- 88.76% of the patients with heart disease belonged to class IV and V socioeconomic status.
- 96.03% patients in the study group were booked cases.
- 22.78% of the patients were diagnosed to have heart disease during pregnancy and 77.22% were diagnosed before pregnancy.
- 90.82% of the patients were young and were less than 30 years of age.
- Only 1.8% of the study group were grand multigravida.
- 48.81% had rheumatic heart disease, 29.29% had congenital heart disease, 15.39% had mitral valve prolapse syndrome,

1.78% had primary pulmonary hypertension and 2.66% had cardiomyopathy.

- Isolated cases of mitral stenosis contributed to 35.15% of the cases and mitral stenosis was seen in combination with other valvular lesions in 40.01% of the patients.
- ASD is the most common congenital heart disease seen in the study group with an incidence of 40.41%.
- 15.39% patients had MVPS in the study group.
- 54 patients had undergone surgical treatment for heart disease.
- 304 patients adopted some form of sterilisation out of which 44.4% underwent permanent sterilisation. Copper – T was inserted in 55.6% of the patients.
- The perinatal mortality in the study group was 2.3%. Maternal mortality was 4.1% in our study group.
- Among the rare heart diseases,
    1. Primary Pulmonary Hypertension patients had 50% mortality.
    2. Peripartum cardiomyopathy had 25% mortality.
    3. Ellis-van Creveld syndrome had 100% mortality.

CONCLUSION

Heart disease in pregnancy continues to be the majorcause of maternal mortality, preterm birth and perinatal mortality. Favourable outcome in pregnancies complicated by heart disease depends on the following factors:

1. Age, socioeconomic status
2. Functional capacity of the heart
3. Early Booking and better antenatal care
4. Comorbid conditions
5. Quality of medical care

Early termination of pregnancy and prompt use of permanent sterilisation methods improve the survival of women with high risk cardiac disease.

Once the pregnant patient seeks medical care, risk stratification is achieved and pregnancy is continued in low risk group and the patients in high risk group are counselled for termination if necessary.

Multidisciplinary approach with a team of obstetricians, cardiologist, anaesthetist, neonatologist combined with patient education provides the best opportunity to continue pregnancy with a good maternal and perinatal outcome.

In the future maternal mortality in heart disease patients can be brought down significantly by effective preconceptional counselling, and improvements in medical, surgical, antenatal, intranatal, and postnatal care and effective motivation for contraception.

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PROFORMA

NAME:	IP.NO:	LMP:	DOA:
AGE:	UNIT:	EDD:	DOD:
SEX:		GPLA:	DODIS:
ADDRESS:		BOOKING STATUS:	
		IMMUNISATION:	

1.G.A. AT PRESENTATION :

ASSOCIATED PREGNANCY :

COMPLICATION

TYPE OF HEART DISEASE : CHD/ RHD/ OTHERS

ANATOMICAL LESION :

NYHA CLASS :

ASSOCIATED FACTORS : OBESITY/ANAEMIA/FEVER/ INFECTIONS ETC.

PAST OBSTETRIC OUTCOME: EVENTFUL/ UNEVENTFUL

WHAT AND WHEN

PAST MEDICAL HISTORY : Diagnosed/Undiagnosed

When

COURSE :

QUALITY OF CARE :

SURGERIES IF ANY :

IUGR :

CONGENITAL ANOMALIES :

ADMISSION TO NICU :

PUERPERIUM : EVENTFUL/UNEVENTFUL

CONTRACEPTIVE ADVICE :

STERILISATION : TYPE :

ANAESTHESIA :

WHEN DONE :

POST OPERATIVE PERIOD : EVENTFUL/UNEVENTFUL

MATERNAL MORTALITY :

PERINATAL MORTALITY :

INVESTIGATIONS :

PRESENT PREGNANCY

1. Effect of Pregnancy on Heart Disease :

   Heart failure/ Arrhythmias / pulmonary

   Edema

   Management :

2. Effect of Heart Disease on Pregnancy :

   Preterm Labour/ IUGR :

   Management :

3. Labour Stages

   First stage: Posture :

   Pain relief methods :

   Duration :

   Second stage: Duration :

   Prophylactic forceps

   / vacuum :

   Third stage : Complications :

   Management :

4. Caesarean Section : Elective/ Emergency

   Indication :

   Type of Anaesthesia :

Complications :

Management :

5. Baby – Male/ Female :

Birth weight :

APGAR :

Preterm / Term / Postdated :

S.No 2	NAME	AGE	IP NO.	PARITY	SES	BOOKING STATUS	HEART DISEASE TYPE	PURPOSE OF ADMISSION	NYHA STATUS	OUTCOME OF PREGNANCY	SEX OF BABY	B.WT(in KG)	MATURITY	COMPLICATIONS OF HD	MATERNAL COMPLICATION	FETAL COMPLICATION	CONTRACEPTIONS
1	KUMARI	23	192	PRIMI	IV	B	MS/MR	SC	II	OUTLET FORCEPS	M	2.7	T	-	-	-	Cu-T
2	SHOBANA	21	378	PRIMI	IV	B	MVPS	SC	I	EMER.LSCS -FAILED ACCELERATION	M	3	T	-	-	-	PS
3	KAVITHA	20	891	PRIMI	V	B	MVPS/MILD MR	SC	II	OUTLET FORCEPS	M	3.1	T	-	-		Cu-T
4	HEMALATHA	23	2043	G2P1L1	V	B	ASD	SC	I	LABOUR NATURALE	F	2.75	T	-	-	-	Cu-T
5	KAVITHA	23	2136	PRIMI	V	B	1ST DEGREE HEART BLOCK	SC	I	OUTLET FORCEPS	M	2.75	T	-	-	-	Cu-T
6	RAJATHI	22	33897	G2P1L0	III	B	MR/ trivial TR	SC	I	EMER.LSCS-FETAL DISTRESS	M	2.75	T	-	-	-	Cu-T
7	MAHESWARI	23	3623	PRIMI	IV	B	moderate MS	SC	II	EMER.LSCS-FETAL DISTRESS	M	3	T	-	-	-	Cu-T
8	SUMATHI	20	3388	PRIMI	IV	B	moderate MS	SC	II	OUTLET FORCEPS	M	2.5	T	-	-	RDS	Cu-T
9	SHANTHI	29	3137	G2P1L1	V	B	moderate MS/severe MR	SC	II	EMER.LSCS-FETAL DISTRESS	M	2	T	-	-	IUGR	Cu-T
10	BHAVANI	24	4413	G3P1L1A1	IV	B	severe MS/ moderate MR/ TR/ PHT	SC	III	OUTLET FORCEPS	M	2.7	T	-	-	-	PS
11	RENUKA	20	4249	PRIMI	V	B	MS/ MR/ TR/ PHT	SC	II	OUTLET FORCEPS	F	3.05	T	-	-	-	Cu-T
12	MANIMEGALAI	26	4823	G3P2L1	IV	B	moderate MS/ mild MR/ TR/ AR/ mild PHT	SC	II	OUTLET FORCEPS	M	2.8	T	-	-		PS
13	SHANTHI	24	4454	G2P1L1	IV	B	PDA OPERATED	SC	I	OUTLET FORCEPS	F	2.75	T	-	-	-	PS
14	NAMBEESWARI	24	3515	G3P2L2	V	B	2nd DEGREE HEART BLOCK	SC	II	OUTLET FORCEPS	M	2.75	T	-	-	-	PS
15	INDRA	24	5137	G2P1L1	V	B	ASD CLOSURE DONE	SC	I	LABOUR NATURALE	F	2.8	T	-	-	-	PS
16	SEETHALAKSHMI	24	5243	G2P1L1	III	B	trivial MR	SC	I	LABOUR NATURALE	M	2.25	T	-	-	-	PS
17	JAYANTHI	24	5241	G2P1L1	IV	B	VSD	SC	II	OUTLET FORCEPS	F	2.6	T	-	-	-	PS
18	KOMALAVALLI	29	5866	G2P1L1	IV	B	IAS ANEURYSM/ASD	SC	II	LABOUR NATURALE	F	2.5	T	-	-	-	PS
19	NITHYA	24	5829	G2P1L1	IV	B	MS/MR/PHT/MVR done	SC	II	OUTLET FORCEPS	M	2.4	T	-	-	-	PS
20	YOGESWARI	20	6060	PRIMI	V	B	mild TR	SC	I	LABOUR NATURALE	M	3.15	T	-	-	-	Cu-T
21	RAMA	26	6397	PRIMI	V	B	mild MR/ moderate MS/ trivial TR/ moderate PHT	SC	II	OUTLET FORCEPS	M	2.5	T	-	-	-	Cu-T
22	GOVINDAMMAL	28	5947	G2P1L1	IV	B	ASD/ PHT	SC	II	ELECTIVE RPT LSCS-PREV LSCS/ BREECH	M	2.95	T	-	-	-	LSCS-ST

23	REVATHI	22	7048	PRIMI	III	B	PRIMARY PULMONARY HYPERTENSION	SC	III	EMER.LSCS-FETAL DISTRESS	F	2.5	T	-	-	-	Cu-T
24	ANJALI	21	6045	PRIMI	IV	B	ASD CLOSURE DONE	SC	I	OUTLET FORCEPS	M	2.45	T	-	-	-	Cu-T
25	LAKSHMI	28	6782	G2P1L1	IV	B	MS/MR/MVR done	SC	II	VACCUM EXTRACTION	M	2.6	T	-	-	-	PS
26	NIRANJANA	23	7852	G2P1L1	V	B	MS/ MR	SC	II	LABOUR NATURALE	F	2.5	T	-	-	-	PS
27	NITHYA	21	6367	PRIMI	IV	B	TGA CORRECTED	SC	II	VACCUM EXTRACTION	F	2.9	T	-	-	-	Cu-T
28	DHANAKODI	21	7975	PRIMI	IV	B	mild TR/ moderate PHT	SC	II	OUTLET FORCEPS	F	2.2	T	-	-	SGA	Cu-T
29	PRIYA	23	6585	G2P1L0	V	B	severe MR/ MVR DONE	SC	II	OUTLET FORCEPS	M	2.8	T	-	-	-	Cu-T
30	MANONMANI	25	8415	G2P1L1	V	B	ASD CLOSURE DONE	SC	II	EMER RPT LSCS- PREV LSCS/ CPD	F	2.5	T	-	-	-	LSCS-ST
31	YOGESWARI	21	8756	PRIMI	V	B	MR	SC	I	OUTLET FORCEPS	M	3.1	T	-	-	-	Cu-T
32	PARAMESWARI	23	8798	PRIMI	V	B	severe MS/ trivial AR/ moderate PHT	SC	III	OUTLET FORCEPS	F	2.3	T	-	-	-	Cu-T
33	ANITHA	26	9311	G2A1	III	B	MVPS of AML/ trivial TR/ global hypokinesia	SC	III	OUTLET FORCEPS	F	2.75	T	-	-	-	Cu-T
34	PRIYA	19	8666	PRIMI	IV	B	mild MR/ moderate AR/ no PHT	SC	III	LABOUR NATURALE	F	3	T	-	-	-	Cu-T
35	SATHYAVANI	20	8037	G2A1	IV	B	moderate MR	SC	II	OUTLET FORCEPS	M	2.7	T	-	-	-	Cu-T
36	CHITHRA	29	8662	PRIMI	IV	B	VSD SPONTANEOUS CLOSURE	SC	I	EMER.LSCS-FETAL DISTRESS	F	2.75	T	-	-	-	Cu-T
37	ABIRAMI	25	10755	G3P2L2	IV	UB	severe MS/ VPC	SC	III	LABOUR NATURALE	F	2.6	T	-	-	-	PS
38	LAKSHMI	28	10734	G2P1L1	V	B	moderate MS/ PHT	SC	II	EMER.RPT.LSCS-PREV. LSCS/1ST TWIN BREECH	M,M	1.5,1.4	PT,PT	-	-	RDS	Cu-T
39	PAPPATHI	28	7967	PRIMI	V	B	PRIMARY PULMONARY HYPERTENSION	SC	III	OUTLET FORCEPS	M	2.75	T	-	-	-	Cu-T
40	KALPANA	24	8114	G2P1L1	V	B	MR	SC	I	EMER.LSCS-FAILED INDUCTION	M	2.5	T	-	-	-	LSCS-ST
41	DEVI	27	8154	G4P2L1	V	B	severe MS/ mild MR	SC	II	ELECTIVE RPT LSCS-PREV LSCS/CPD	F	2.6	T	-	-	-	LSCS-ST
42	ILAKKIYA	19	9908	PRIMI	V	B	moderate MS/ severe MR/ TR/ severe PHT	SC	III	OUTLET FORCEPS	F	2.6	T	-	-	-	Cu-T
43	ESWARI	24	10974	PRIMI	IV	B	MVP/ mild MR/ mild PHT	SC	II	VACCUM EXTRACTION	F	2.75	T	-	-	-	Cu-T
44	NITHYA	23	11922	PRIMI	V	B	acyanotic TETRALOGY OF FALLOT	SC	III	LABOUR NATURALE	M	2.5	T	-	-	-	Cu-T
45	REKHA	22	10450	G2P1L1	V	B	severe MR/ MVR DONE	SC	II	EMER.LSCS-FETAL DISTRESS	F	2.775	T	-	-	-	LSCS-ST
46	REVATHI	24	11993	PRIMI	V	B	ASD CLOSURE DONE	SC	I	LABOUR NATURALE	F	2.3	T	-	-	IUD	Cu-T
47	BHARATHI	28	11889	PRIMI	IV	B	severe MR	SC	III	OUTLET FORCEPS	M	2.6	T	-	-	-	Cu-T

48	LAKSHMI	28	12402	G3P1L1A1	IV	B	PERIPARTUM CARDIOMYOPATHY	SC	IV	LABOUR NATURALE	F	2.5	T	CCF	-	-	Cu-T
49	MENAKA	22	11787	G2A1	IV	B	severe AS/ severe AR	SC	III	OUTLET FORCEPS	F	1.7	PT	-	-	-	Cu-T
50	VENDALAVANYA	23	12543	G2P1L1	V	B	severe MS/ mild PHT	SC	III	EMER.RPT.LSCS-PREVLSCS/CPD	M	3.1	T	-	-	-	LSCS-ST
51	NITHYA	27	12030	G2P1L1	IV	B	mild MR/ MVPS	SC	I	EMER.RPT.LSCS-PREVLSCS/CPD	F	2.9	T	-	-	-	LSCS-ST
52	NIRMALA	26	12505	G2P1L1	III	B	severe MS/ moderate PHT	SC	III	ELECTIVE RPT LSCS-PREV LSCS/CPD	M	3.2	T	-	-	-	LSCS-ST
53	PREMA	25	12862	G2A1	IV	B	severe MS/ moderate PHT/ CMC done	SC	III	OUTLET FORCEPS	M	2.75	T	-	-	-	Cu-T
54	KRISHNAVENI	25	12834	PRIMI	V	B	moderate MS/ moderate to severe AR	SC	III	EMER.LSCS-CPD/FAILED ACCELERATION	F	2.3	T	-	-	-	Cu-T
55	KANNIYAMMAL	28	14321	PRIMI	V	B	VSD CLOSURE/ AORTIC VALVE REPLACED	SC	II	OUTLET FORCEPS	M	2.55	T	-	-	-	Cu-T
56	RAMYA	20	11779	PRIMI	IV	B	mild MS/ trivial MR	SC	II	OUTLET FORCEPS	F	2.75	T	-	-	-	Cu-T
57	PARAMESWARI	22	15028	G2P1L1	IV	B	severe MS/ severe PHT	SC	III	LABOUR NATURALE	F	2.7	T	-	-	-	PS
58	MOHANALAKSHMI	28	12599	PRIMI	V	B	VSD	SC	I	OUTLET FORCEPS	F	2.6	T	-	-	-	Cu-T
59	DHANALAKSHMI	21	15102	G2P1L1	V	B	trivial MR	SC	I	OUTLET FORCEPS	M	2.25	T	-	-	-	PS
60	VASUKI	24	14962	G3P1LOA 1	V	B	MS/ MR/ AR	SC	II	OUTLET FORCEPS	M	2	PT	-	-	-	-
61	BRINDHA	25	14056	PRIMI	IV	B	mild TR	SC	I	EMER.LSCS-FAILED INDUCTION	M	3.25	T	-	-	-	Cu-T
62	PATCHAIAMMAL	29	10661	PRIMI	IV	B	severe MR/ cririca MS/ moderate PHT	SC	IV	EMER.LSCS-CPD/FAILED ACCELERATION	M	2.5	T	CCF	-	-	Cu-T
63	SRIDEVI	30	15026	PRIMI	IV	B	ASD CLOSURE DONE	SC	I	EMER.LSCS-FAILED INDUCTION	F	2.25	T	-	-	-	Cu-T
64	SHANMUGALAKSHMI	27	15562	G2P1L1	III	B	MS/ CMC DONE	SC	II	EMER.RPT.LSCS-PREVLSCS/CPD	F	2.4	T	-	-	-	LSCS-ST
65	SAKIYA	24	157931	G2P1L1	IV	B	trivial MR	SC	I	ELECTIVE RPT LSCS-PREV LSCS/ CPD	M	3	T	-	-	-	LSCS-ST
66	PARAMESWARI	20	16326	PRIMI	IV	B	VSD	SC	I	OUTLET FORCEPS	F	2.5	T	-	-		Cu-T
67	SARANYA	22	13261	PRIMI	V	B	mild MR	SC	I	EMER LSCS-FETAL DISTRESS	F	1.7	T	-	-	IUGR	Cu-T
68	ESTHERKANI	25	17739	G3P2L1	V	B	MR/TR/ MVPS	SC	II	OUTLET FORCEPS	F	3.1	T	-	-	-	PS
69	AMSA	28	17764	G3P1L1A1	IV	B	MS/ MR	SC	II	OUTLET FORCEPS	M	2.25	T	-	-	-	PS
70	LAKSHMI	23	17280	G2P1L1	IV	B	mild to moderate MR/ MVPS	SC	II	ELECTIVE RPT LSCS-PREVLSCS/CPD	F	3.25	T	-	-	-	LSCS-ST
71	RUKMANI	20	18049	PRIMI	IV	B	moderate AS/ mild AR	SC	II	EMER.LSCS-CPD/FAILED ACCELERATION	M	2.6	T	-	-	-	Cu-T
72	SULOCHANA	35	16723	G3P2L2	V	UB	MS/MR	SC	II	LABOUR NATURALE	M	2.5	T	-	-	-	PS

73	ABIRAMI	22	17970	PRIMI	V	B	mild MR	SC	I	LABOUR NATURALE	F	3	T	-	-	IUD	-
74	RAMA	26	18370	PRIMI	III	B	MS/ CMC DONE	SC	II	OUTLET FORCEPS	F	2	PT	-	-	-	Cu-T
75	SATHYAVANI	22	18563	PRIMI	IV	B	ASD/ PHT	SC	I	EMER.LSCS-CPD/FAILED ACCELERATION	M	2.75	T	-	-	-	Cu-T
76	SEETHA	21	19161	PRIMI	III	B	MVPS OF AML	SC	I	EMER.LSCS-PRIMI/BREECH	M	1.75	PT	-	-	-	Cu-T
77	JAYANTHI	25	16372	PRIMI	IV	B	VSD	SC	I	OUTLET FORCEPS	M	2.7	T	-	-	-	Cu-T
78	AMUL	23	20385	G2P1L1	V	B	VSD OPERATED	SC	I	EMER.LSCS-BREECH	F	3.5	T	-	-	-	LSCS-ST
79	KAVERI	23	20416	G2P1L1	V	B	ASD	SC	I	LABOUR NATURALE	F	2.5	T	-	-	-	PS
80	USHARANI	25	20393	PRIMI	IV	B	ASD CLOSURE DONE	SC	I	EMER.LSCS-SEVERE PREECLAMPSIA	F	2.15	T	-	-	-	Cu-T
81	JEEVA	36	20650	G5P1L1A3	V	B	MVPS/trivial mr	SC	I	ELECTIVE RPT LSCS-PREVLSCS/CPD	M	2.75	T	-	-	-	LSCS-ST
82	HEMALATHA	23	21252	PRIMI	III	B	mild TR	SC	I	VACCUM EXTRACTION	M	3	T	-	-	-	Cu-T
83	IRFANA	23	20420	G2P1L1	V	B	severe MS/ trivial MR/ moderate PHT	SC	III	OUTLET FORCEPS	F	2.5	T	-	-	-	PS
84	CHITHRA	23	20745	G2P1L1	IV	B	DILATED CARDIOMYOPATHY	SC	III	OUTLET FORCEPS	F	2.4	T	-	-	-	PS
85	SUGANYA	18	21560	PRIMI	IV	B	mild MR/ mild TR	SC	II	OUTLET FORCEPS	F	2.4	T	-	-	-	Cu-T
86	PRIYA	20	21295	PRIMI	IV	B	critical MS/ moderate MR/ moderate PHT	SC	III	OUTLET FORCEPS	F	1.7	T	-	-	SGA	-
87	ADHILAKSHMI	20	20740	G2P1L1	V	B	AS / CONGENITAL BICUSPID VALVE	SC	III	LABOUR NATURALE	F	2.75	T	-	-	-	PS
88	SIRIYAPUSHPAM	24	18798	PRIMI	III	B	mild MS/ AR	SC	II	OUTLET FORCEPS	F	3	T	-	-	-	Cu-T
89	KALAISELVI	28	22144	G2P1L1	V	B	severe MS/ mild MR/ PHT	SC	III	ELECTIVE RPT LSCS-PREVLSCS/FLEXED BREECH	M	2.9	T	-	-	-	LSCS-ST
90	AMUDHA	26	22752	G2P1L1	IV	B	MS/ MVR	SC	II	LABOUR NATURALE	F	1.8	T	-	-	-	PS
91	KRISHNAVENI	25	22554	G2P1L1	V	B	mild MR/ mild TR	SC	I	OUTLET FORCEPS	M	2.5	T	-	-	-	PS
92	NAGAMANI	19	23090	PRIMI	IV	B	severe MS/ MR/ severe PHT	SC	IV	OUTLET FORCEPS	F	2.1	T	CCF	-	-	Cu-T
93	POONGODI	27	23639	G4P2L2A1	V	UB	MVPS	SC	I	OUTLET FORCEPS	M	3.5	T	-	-	-	PS
94	AMBIKA	22	23325	G3P1L1A1	IV	B	ASD	SC	I	ELECTIVE RPT LSCS-PREV.LSCS/CPD	M	2.65	T	-	-	-	LSCS-ST
95	LOGESWARI	18	23543	PRIMI	III	B	ASD CLOSURE DONE	SC	I	OUTLET FORCEPS	F	2.7	T	-	-	-	Cu-T
96	RAZIA	23	24029	PRIMI	IV	B	IAS ANEURYSM/ MR	SC	II	LABOUR NATURALE	F	2.75	T	-	-	-	Cu-T

97	RENUKA	26	25348	G2P1L2	V	B	MVPS of AML	SC	I	LABOUR NATURALE	F	3.15	T	-	-	-	PS
98	PAVITHRA	18	25468	PRIMI	V	B	ASD/ mild TR/ mild PHT	SC	II	OUTLET FORCEPS	F	2.5	T	-	-	-	Cu-T
99	SHOBANA	23	25440	PRIMI	III	B	MR/TR	SC	II	OUTLET FORCEPS	F	2	T	-	-	-	Cu-T
100	PADMA	30	25764	G3P1L1A1	V	B	PDA OPERATED	SC	I	EMER.RPT LSCS-PREV.LSCS/CPD	M	2.75	T	-	-	-	LSCS-ST
101	SHAMEEM	25	26505	G2P1L0	V	B	MS/ MR	SC	II	EMER.RPT LSCS-PREV.LSCS/THREATENED RUPTURE	M	2.9	T	-	-	-	LSCS-ST
102	SARIDHA BAI	21	26295	PRIMI	V	B	ASD	SC	I	OUTLET FORCEPS	M	2.5	T	-	-	-	Cu-T
103	KOKILA	27	27144	PRIMI	IV	B	mild MR/ thickened aortic valve	SC	II	OUTLET FORCEPS	M	2.5	T	-	-	-	Cu-T
104	JAYANTHI	25	27281	PRIMI	IV	B	MVPS	SC	I	OUTLET FORCEPS	M	2.5	T	-	-	-	Cu-T
105	VEDHA	25	19246	PRIMI	IV	B	minimal MS/ moderate MR	SC	II	EMER.LSCS-FETAL DISTRESS/TWINS	M,F	2.6,2.1	T,T	-	-	-	Cu-T
106	REVATHI	20	28764	G3A2	IV	B	VSD OPERATED	SC	I	OUTLET FORCEPS	F	2.5	T	-	-	-	Cu-T
107	CHITHRA	26	28788	G5P2L2A2	IV	UB	mild MR/ TR	SC	I	OUTLET FORCEPS	F	3.1	T	-	-	-	PS
108	YASODHA	28	28757	G2P1L1	IV	B	MVPS/ MR	SC	I	LABOUR NATURALE	F	3.1	T	-	-	-	Cu-T
109	MAHESWARI	32	28758	G2A1	V	B	MS/PHT	SC	II	VACCUM EXTRACTION	F	3.2	T	-	-	-	Cu-T
110	REVATHI	23	28739	G2P1L0	V	B	severe MS/ moderate MR/ moderate AR/ mild TR/ mild PHT	SC	III	EMER.LSCS- FETAL DISTRESS	F	2.5	T	-	-	-	Cu-T
111	NAJIMUNISHA	35	31038	G3P1L1A1	V	B	ASD CLOSURE DONE	SC	I	LABOUR NATURALE	M	2.25	PT	-	-	-	Cu-T
112	SRIMATHI	19	31319	PRIMI	V	B	mild to moderate MR/ MVPS	SC	I	OUTLET FORCEPS	M	3.2	T	-	-	-	Cu-T
113	AMUDHA	25	30344	G2P1L1	III	B	MVPS/ MR	SC	I	ELECTIVE RPT LSCS-PREV.LSCS/CPD	M	3.45	T	-	-	-	LSCS-ST
114	VALARMATHI	23	31664	PRIMI	V	B	acyanoticTETRALOGY OF FALLOT	SC	III	OUTLET FORCEPS	F	2.5	T	-	-	-	Cu-T
115	ANITHA	24	31662	G2A1	IV	B	ASD CLOSURE DONE	SC	I	EMER.LSCS-FETAL DISTRESS	M	3.75	T	-	-	-	Cu-T
116	SATHYA	24	31660	G2P1L0	IV	B	MS/ PHT	SC	II	ELECTIVE RPT LSCS-PREVLSCS/ CPD	F	3.45	T	-	-	-	Cu-T
117	REKHA	22	29980	G3P2L1	IV	B	MS/ MR/ PHT	SC	II	ELECTIVE RPT LSCS/ PREV.LSCS/ CPD	F	2.9	T	-	-	-	LSCS-ST
118	AMUL	25	33140	G2P1L1	III	B	severe MS/ MR/ TR	SC	III	OUTLET FORCEPS	M	2.5	T	-	-	-	PS
119	NASIMA	22	33289	G4P1L1A2	IV	B	MR	SC	I	EMER.RPT.LSCCS-PREV.LSCS/ CPD	M	3.8	T	-	-	-	LSCS-ST

120	VANITHA	25	12128	G2A1	IV	B	ASD CLOSURE DONE	SC	I	EMER.LSCS-FETAL DISTRESS	M	2.5	T	-	-	-	Cu-T
121	VISALAM	26	32607	PRIMI	V	B	MR/ PHT	SC	II	EMER.LSCS-FETAL DISTRESS	M	2.6	T	-	-	-	Cu-T
122	VANI	37	33986	G3P1L1A1	V	B	AR/ MVPS	SC	I	OUTLET FORCEPS	M	2.75	T	-	-	-	Cu-T
123	ZENATH	24	31787	PRIMI	V	B	mild TR/ moderate PHT	SC	II	OUTLET FORCEPS	M	3	T	-	-	-	Cu-T
124	KUMUDHA	20	33130	PRIMI	V	B	MVPS	SC	I	EMER.LSCS-FETAL DISTRESS	M	3.1	T	-	-	-	Cu-T
125	KALPANA	19	35953	PRIMI	IV	B	VSD OPERATED	SC	I	EMER.LSCS-CPD MAJOR	M	3.8	T	-	-	-	Cu-T
126	AMMU	27	36331	G2P1L1	V	B	AS/ AR	SC	II	EMER.RPT.LSCS-PREV.LSCS/ CPD	F	2.8	T	-	-	-	LSCS-ST
127	GOMATHI	28	36477	G3P2L2	IV	UB	severe MS	SC	IV	OUTLET FORCEPS	M	2.6	T	ATRIAL FIBRILLATION/ CCF	-	-	PS
128	MANJULA	25	36623	G2P1L1	III	B	VSD OPERATED	SC	I	ELECTIVE RPT LSCS-PREV.LSCS/CPD	M	2.8	T	-	-	-	LSCS-ST
129	REVATHI	22	36745	G2P1L1	IV	B	mild TR	SC	I	OUTLET FORCEPS	M	2	T	-	-	-	PS
130	BANU	21	36583	G2P1L1	IV	B	severe MS/ PHT/ CMC DONE	SC	III	OUTLET FORCEPS	M	2.6	T	-	-	-	PS
131	GEETHA	25	34794	G2P1L1	V	B	severe MS/ moderate MR/ mild PHT	SC	III	ELECTIVE RPT LSCS-PREV.LSCS/BREECH	F	3.45	T	-	-	-	LSCS-ST
132	RANI	23	37175	PRIMI	V	B	LUTEMBACHER SYNDROME(MS/ ASD)	SC	II	EMER.LSCS-CPD/FAILED ACCELERATION	M	3	T	-	-	-	Cu-T
133	LIBIYAGLORY	23	37179	PRIMI	V	B	VSD OPERATED	SC	I	EMER.LSCS- FETAL DISTRESS	F	2.8	T	-	-	-	Cu-T
134	MAHESWARI	23	37700	PRIMI	V	B	mild AR / mild MR/ CMC DONE	SC	II	EMER.LSCS-CPD MAJOR	F	2.95	T	-	-	-	Cu-T
135	DEVI	27	37715	PRIMI	V	B	ISOLATED DEXTROCARDIA	SC	II	EMER.LSCS- FETAL DISTRESS	F	2.8	T	-	-	-	Cu-T
136	KALAIVANI	29	38474	PRIMI	IV	B	CONGENITAL BICUSPID AORTIC VALVE	SC	II	EMER.LSCS- FETAL DISTRESS	F	2.3	T	-	-	-	Cu-T
137	BHAVANI	24	38547	G2P1L1	V	B	SICK SINUS SYNDROME	SC	III	LABOUR NATURALE	M	2.6	T	PERMANENT PACEMAKER	-	-	Cu-T
138	GOWRAMMAL	21	38584	G2A1	IV	B	WPW SYNDROME	SC	II	EMER.LSCS- FETAL DISTRESS	M	3.3	T	-	-	-	Cu-T
139	CHITHRA	35	38469	G3P2L2	III	B	moderate MR/ PHT	SC	II	OUTLET FORCEPS	M	2.5	T	-	-	-	Cu-T
140	SEETHA	24	195	G3P1L1A1	V	B	mild MR/ mild TR	SC	I	OUTLET FORCEPS	F	2.75	T	-	-	-	PS
141	SANGEETHA	28	37952	PRIMI	III	B	COARCTATION OF AORTA	SC	III	ELECTIVE LSCS-CPD MAJOR/ COARCTATION OF AORTA	F	2.9	T	-	-	-	Cu-T

142	DEEPA	27	38816	G2P1L1	V	B	PERIPARTUM CARDIOMYOPATHY	SC	IV	ELECTIVE RPT LSCS-PREV.LSCS/ CPD	M	3.5	T	CCF	-	-	LSCS-ST
143	PANDIAMMAL	23	1047	PRIMI	III	B	ASD CLOSURE DONE	SC	I	EMER.LSCS- FETAL DISTRESS	M	3.3	T	-	-	-	Cu-T
144	KALA	21	1527	PRIMI	IV	B	VSD/ SUBPULMONIC STENOSIS	SC	II	OUTLET FORCEPS	M	2.4	T	-	-	-	Cu-T
145	PARAMESWARI	28	1686	PRIMI	IV	B	COARCTATION OF AORTA	SC	III	ELECTIVE LSCS-COARCTATION OF AORTA	F	2.25	T	-	-	-	Cu-T
146	JAYACHITHRA	26	1111	G3P2L2	IV	UB	ASD/ MS/ MVR DONE	SC	III	OUTLET FORCEPS	F	1.85	PT	-	-	RDS	PS
147	SHEELA	18	1241	PRIMI	V	B	MR/ mild TR	SC	I	OUTLET FORCEPS	M	3	T	-	-	-	Cu-T
148	JAYAPRADHA	22	2131	PRIMI	V	B	MS/ PHT/ severe MVPS	SC	II	OUTLET FORCEPS	M	1.6	PT	-	-	RDS	-
149	MEERA	20	2517	G2P1L1	IV	B	MVPS/ trivial TR/ trivial MR	SC	I	EMER.RPT.LSCS-THREATENED RUPTURE	F	2.5	T	-	-	RDS	PS
150	ASHA	24	3036	G2P1L1	IV	B	MVPS/MR	SC	II	OUTLET FORCEPS	F	3.25	T	-	-	-	PS
151	DEVI	24	3025	G2P1L1	IV	B	mild MS/ moderate MR	SC	II	OUTLET FORCEPS	F	3	T	-	-	-	PS
152	MADHUBALA	20	2781	G2P1L1	V	B	mild MR	SC	I	OUTLET FORCEPS	F	2.6	T	-	-	-	PS
153	ANEES NISHA	25	3294	G3P2L2	V	B	mild MR/ TR	SC	I	EMER.LSCS- BREECH	F	3.25	T	-	-	-	LSCS-ST
154	MALLIGA	23	2408	G3P1L1A1	III	B	ASD	SC	I	OUTLET FORCEPS	F	2.6	T	-	-	-	Cu-T
155	VALARMATHI	20	3290	PRIMI	IV	B	moderate AS/ AR/ MR	SC	II	EMER.LSCS- FETAL DISTRESS	F	3.8	T	-	-	-	Cu-T
156	SANGEETHA	27	4485	PRIMI	V	B	trivial TR	SC	I	EMER.LSCS - FETAL DISTRESS	F	3.1	T	-	-	-	PS
157	NISHA	20	4506	PRIMI	IV	B	mild AS/ mild MR	SC	III	EMER.LSCS- FETAL DISTRESS	F	3.1	T	-	-	-	Cu-T
158	SHARMILA	23	4677	PRIMI	IV	B	ACYANOTIC TETRALOGY OF FALLOT	SC	III	OUTLET FORCEPS	F	2.2	T	severe RV OUTLET OBSTRUCTION	-	-	Cu-T
159	LATHA	25	4315	G2P1L1	V	B	PERIPARTUM CARDIOMYOPATHY	SC	IV	ELECTIVE RPT LSCS-PREV.LSCS/ CPD	F	3.75	T	CCF	-	-	LSCS-ST
160	DHANALAKSHMI	25	4629	G2P1L0	V	B	HYPERTROPHIC NON OBSTRUCTIVE CARDIO MYOPATHY	SC	III	EMER.LSCS-TRANSVERSE LIE	M	3.25	T	-	-	-	Cu-T
161	JOTHILAKSHMI	23	4526	PRIMI	V	B	MVPS	SC	I	VACCUM EXTRACTION	M	2.4	PT	-	-	-	Cu-T
162	SURYA	22	3410	PRIMI	V	B	severe MS/ trivial TR/ moderate PHT	SC	III	EMER.LSCS- CPD MAJOR	M	2.75	T	-	-	-	Cu-T
163	MANJU	21	5528	PRIMI	III	B	mild MS moderate MR	SC	II	EMER.LSCS- CPD/ FAILED ACCELERATION	F	3.25	T	-	-	-	Cu-T
164	SUMATHI	25	6027	PRIMI	IV	B	perimembrnous VSD/ PULMONARY HYPERTENSION	SC	II	EMER.LSCS-TRANSVERSE LIE	M	2.9	T	-	-	-	Cu-T

165	ASHA	22	6138	G2P1L1	IV	B	moderate MS/ MR	SC	II	LABOUR NATURALE	M	2.3	T	-	-	-	PS
166	REVATHI	21	6302	PRIMI	III	B	ASD	SC	I	EMER.LSCS- FETAL DISTRESS	M	2.85	T	-	-	-	Cu-T
167	PAVUN	23	6225	PRIMI	V	B	EBSTEIN'S ANOMALY	SC	III	EMER.LSCS- FETAL DISTRESS	M	3	T	-	-	RDS	Cu-T
168	SUBHA	21	6666	PRIMI	IV	B	ASD CLOSURE DONE	SC	I	EMER.LSCS- CPD/ FAILED ACCELERATION	F	2.8	T	-	-	-	Cu-T
169	SARALA	22	6635	G2P1L1	IV	B	mild AR	SC	II	LABOUR NATURALE	M	2.8	T	-	-	-	PS
170	DEEPA	21	6538	PRIMI	IV	B	MVPS/ mild PR	SC	I	EMER.LSCS- FETAL DISTRESS	M	2.2	T	-	-	-	Cu-T
171	GEETHA	25	6727	G2P1L0	V	B	mild MR	SC	I	LABOUR NATURALE	M	2.25	T	-	-	-	Cu-T
172	SATHYA	21	6264	G2P1L1	V	B	ASD	SC	IV	LABOUR NATURALE	M	2.3	T	SUPRAVENTRICULAR TACHYCARDIA	-	-	-
173	ANNAPOORANI	24	6092	G2P1L1	IV	B	PDA NOT OPERATED	SC	II	EMER.LSCS- FETAL DISTRESS	F	3.25	T	-	-	-	LSCS-ST
174	SANGEETHA	24	6599	G3P1L1A1	V	B	ASD CLOSURE DONE	SC	I	EMER.RPT.LSCS-PREVLSCS/CPD	M	3	T	-	-	-	LSCS-ST
175	SATHYA	24	6602	G2P1L1	V	B	VSD SPONTANEOUS CLOSURE	SC	I	OUTLET FORCEPS	F	3.2	T	-	-	-	PS
176	JUBETHA	20	7595	PRIMI	V	B	MVPS OF AML	SC	I	LABOUR NATURALE	F	1.7	PT	-	-	RDS	-
177	SONA	24	7482	G2P1L1	IV	B	moderate MR	SC	II	EMER.RPT.LSCS-PREVLSCS/CPD	M	2.8	T	-	-	-	LSCS-ST
178	SANDHYA	19	7887	PRIMI	V	B	acyanotic TETRALOGY OF FALLOT	SC	III	OUTLET FORCEPS	F	2.5	T	-	-	-	Cu-T
179	VALLIYAMMAL	25	8197	G2P1L1	III	B	moderate MS/ mild MR/ TR/ AR/ mild PHT	SC	III	OUTLET FORCEPS	F	2.5	T	-	-	-	PS
180	PUSHPA	35	8356	G3P2L2	IV	UB	severe MS/ mild MR	SC	III	OUTLET FORCEPS	M	2.75	T	-	-	-	PS
181	PRABAVATHI	28	8413	PRIMI	III	B	MVPS	SC	I	EMER.LSCS- CPD/ FAILED ACCELERATION	F	4.1	T	-	-	-	Cu-T
182	NATHIYA	21	7999	PRIMI	V	B	severe MS/ mild PHT	SC	III	OUTLET FORCEPS	F	2.25	T	-	-	-	Cu-T
183	NAGANANDHINI	29	7630	PRIMI	V	B	mild AR/ TR	SC	II	OUTLET FORCEPS	F	3.4	T	-	-	-	Cu-T
184	DHATCHAYANI	22	9600	PRIMI	IV	B	moderate MS	SC	II	OUTLET FORCEPS	F	3	T	-	-	-	Cu-T
185	ARCHANA	20	8689	PRIMI	IV	B	MR / TR	SC	II	OUTLET FORCEPS	F	2.9	T	-	-	-	Cu-T
186	MEGALA	26	9149	G3P2L2	V	UB	ASD CLOSURE DONE	SC	I	OUTLET FORCEPS	F	3.25	T	-	-	-	PS
187	RAMA	27	10125	G2P1L1	V	B	severe MS/ mild MR/ moderate TR/ moderate PHT/ CMC DONE	SC	III	OUTLET FORCEPS	F	2.9	T	-	-	-	Cu-T

188	VASUKI	32	5112	G3P1L1A1	III	B	moderate MS/ mild PHT/ CMC DONE	SC	III	OUTLET FORCEPS	F	3	T	-	-	-	PS
189	LUBINAMARY	23	10472	G2P1L1	V	B	trivial MR	SC	I	ELECTIVE RPT LSCS-PREV.LSCS/ CPD	M	3.75	T	-	-	-	LSCS-ST
190	UMA	24	11187	PRIMI	IV	B	trivial TR	SC	I	OUTLET FORCEPS	F	2.6	T	-	-	-	Cu-T
191	AMUDHA	20	11393	PRIMI	IV	B	MVPS/ AR	SC	I	OUTLET FORCEPS	M	2.5	T	-	-	-	Cu-T
192	VALARMATHI	25	11666	G2P1L1	IV	B	MS/ MR	SC	II	OUTLET FORCEPS	M	3	T	-	-	-	Cu-T
193	SOWDAMANI	27	11793	G2P1L1	V	B	moderate MS	SC	II	LABOUR NATURALE	F	3.2	T	-	-	-	PS
194	PAPPUTHAI	25	12294	G3P1L1A1	V	B	WPW SYNDROME	SC	II	OUTLET FORCEPS	M	3	T	-	-	-	PS
195	MUNIYAMMAL	39	12283	G8P5L5A2	V	UB	severe MS/ moderate PHT	SC	III	OUTLET FORCEPS	M	3.1	T	-	-	-	PS
196	GAYATHRI	27	12712	PRIMI	V	B	trivial MR / trivial TR	SC	I	OUTLET FORCEPS	F	2.8	T	-	-	-	Cu-T
197	DHANABAKKIYAM	26	13855	G2P1L1	V	B	MR/ TR	SC	II	OUTLET FORCEPS	F	2.7	T	-	-	-	PS
198	SEETHA	21	13850	G2P1L1	V	B	severe MS/ MR/ AR/ TR/ mild PHT	SC	III	OUTLET FORCEPS	M	3.5	T	-	-	-	PS
199	SELVI	22	13525	PRIMI	V	B	moderate AS/ BICUSPID AORTIC VALVE	SC	II	OUTLET FORCEPS	M	2.9	T	-	-	-	Cu-T
200	ANITHA	23	15270	PRIMI	III	B	MVPS/PR	SC	I	OUTLET FORCEPS	F	2.5	T	-	-	-	Cu-T
201	SUDHA	22	14735	PRIMI	IV	B	mild MS	SC	II	OUTLET FORCEPS	F	2.7	T	-	-	-	Cu-T
202	SIVARANJANI	23	15791	PRIMI	IV	B	ASD/ TR	SC	I	EMER.LSCS- FETAL DISTRESS	M	2.9	T	-	-	-	Cu-T
203	SATHYA	27	16002	PRIMI	IV	B	moderate MS/ PHT	SC	II	OUTLET FORCEPS	F	2.5	T	-	-	-	Cu-T
204	KANCHANADEVI	24	14598	G2P1L1	IV	B	mild MS/ trivial MR	SC	II	ELECTIVE RPT LSCS-PREV.LSCS/ CPD	F	2.7	T	-	-	-	LSCS-ST
205	NARAYANAMMA	25	11573	PRIMI	IV	B	PRIMARY PULMONARY HYPERTENSION	SC	IV	EMER.LSCS- TWINS/ FETAL DISTRESS	F,F	1.2,1.1	PT,PT	CCF	-	RDS	-
206	MEGALA	23	16371	G3P1L1A1	IV	B	MS/ VPC	SC	III	EMER.RPT.LSCS-PREV.LSCS/ CPD	F	2.6	T	-	-	-	LSCS-ST
207	DILLIRANI	28	15334	G2A1	V	B	mild MR	SC	I	LABOUR NATURALE	F	2.75	T	-	-	-	Cu-T
208	JAMEELA	22	15079	PRIMI	V	B	PULMONARY STENOSIS	SC	II	OUTLET FORCEPS	M	2.6	T	-	-	-	Cu-T
209	GUNASUNDARI	27	13956	G4P1L1A2	IV	B	MS/ MR CMC DONE	SC	IV	OUTLET FORCEPS	F	2.3	T	ATRIAL FIBRILLATION/ CCF	-	-	PS
210	JAYASHREE	24	16683	G3P1L1A1	IV	B	MVPS OF AML	SC	I	EMER.RPT.LSCS-PREV.LSCS/ SEVERE OLIGOHYDRAMNIOS	M	2.75	T	-	-	-	LSCS-ST

211	DHANALAKSHMI	25	15192	G3P2L1	V	B	trivial TR	SC	I	LABOUR NATURALE	M	1.5	PT	-	-	-	Cu-T
212	RAJANGAMMAL	27	18585	G2P1L1	IV	B	MVPS	SC	I	OUTLET FORCEPS	M	2.75	T	-	-	-	PS
213	RADHA	23	14400	PRIMI	III	B	mild MS	SC	I	OUTLET FORCEPS	M	2.3	T	-	-	-	Cu-T
214	NITHYA	22	17228	PRIMI	V	B	MS/ CMC DONE	SC	II	OUTLET FORCEPS	F	3	T	-	-	-	Cu-T
215	SARALA	26	17138	PRIMI	IV	B	ASD CLOSURE DONE	SC	I	OUTLET FORCEPS	F	2.75	T	-	-	-	Cu-T
216	PRAVEENA	23	15945	G2A1	IV	B	IAS ANEURYSM/ TR	SC	II	OUTLET FORCEPS	F	2.6	T	-	-	-	Cu-T
217	CHITHRA	21	17411	PRIMI	IV	B	ASD/ VSD OPERATED	SC	II	LABOUR NATURALE	F	2.4	T	-	-	-	Cu-T
218	NITHYA	22	17384	PRIMI	V	B	MS	SC	II	EMER.LSCS- FETAL DISTRESS	F	2.5	T	-	-	-	Cu-T
219	NANDHINI	20	17675	PRIMI	IV	B	MVPS/ trivial MR	SC	I	OUTLET FORCEPS	M	2.5	T	-	-	-	Cu-T
220	ASHA	25	17767	PRIMI	IV	B	MVPS/ MR	SC	II	OUTLET FORCEPS	M	2.6	T	-	-	-	Cu-T
221	NAZEERABEGAM	23	18099	PRIMI	V	B	MVPS	SC	I	LABOUR NATURALE	F	2.5	T	-	-	-	Cu-T
222	RUCKMANI	26	18149	G2P1L1	IV	B	VSD	SC	I	VBAC/ LABOUR NATURALE	M	2.1	T	-	-	-	Cu-T
223	SHANMUGAPRIYA	23	18146	PRIMI	IV	B	MVPS/ mild MR	SC	II	EMER.LSCS- CDP/ FAILED ACCELERATION	F	3.5	T	-	-	-	Cu-T
224	MUNIYAMMAL	20	18700	G2A1	V	B	MVPS/ mild MR	SC	I	EMER.LSCS- CORD PRESENTATION	M	2.75	T	-	-	-	Cu-T
225	JAYANTHI	23	18688	G2P1L1	IV	B	AS/ AR	SC	II	OUTLET FORCEPS	F	2.5	T	-	-	-	PS
226	PAVITHRA	20	18231	PRIMI	IV	B	severe MR/mild TR	SC	II	OUTLET FORCEPS	F	2.9	T	-	-	-	Cu-T
227	SUSHEELA	29	18763	G4P2L2A1	III	UB	MVPS	SC	I	LABOUR NATURALE	M	2.8	T	-	-	-	PS
228	THENMOZHI	19	19005	PRIMI	IV	B	severe MR	SC	III	OUTLET FORCEPS	M	2.5	T	-	-	-	Cu-T
229	NIRMALA	19	18359	PRIMI	V	B	severe AR/ MVPS	SC	III	OUTLET FORCEPS	F	2.25	T	-	-	-	Cu-T
230	JOTHI	21	16351	PRIMI	IV	B	severe MS/ severe PHT	SC	III	OUTLET FORCEPS	M	2.7	T	-	-	-	Cu-T
231	DILLIRANI	27	19486	G2P1L1	IV	B	mild MR/ trivial TR	SC	II	OUTLET FORCEPS	F	2.2	T	-	-	-	PS
232	SALOMI PRIYA	25	16771	PRIMI	IV	B	mild AR	SC	II	EMER.LSCS- CPD MAJOR	M	3.1	T	-	-	-	Cu-T
233	AMBIKA	22	2663	PRIMI	IV	B	ASD	SC	III	LABOUR NATURALE	M	2.15	PT	-	ANEMIA	RDS	-
234	GOUSIYA	25	23098	G2P1L1	IV	B	severe MS/ TR/ PHT	SC	IV	ELECTIVE RPT LSCS-PREV.LSCS/CPD	F	2.25	T	CCF	ANEMIA	-	LSCS-ST
235	GOMATHI	22	37178	G2P1L1	V	B	MS/MR / AR	SC	IV	ELECTIVE RPT LSCS-PREV.LSCS/ CPD	M	2.8	T	CCF	ANEMIA	-	LSCS-ST

236	RADHA	19	10356	PRIMI	IV	B	trivial TR	SC	III	EMER.LSCS- FETAL DISTRESS	M	3	T	-	ANEMIA	-	Cu-T
237	SRIDEVI	33	13099	G3P1L1A1	IV	B	trivial MR	SC	III	EMER.RPT.LSCS-PREVLSCS/ BREECH	F	3	T	-	ANEMIA/ HBsAg POSITIVE	-	LSCS-ST
238	SARASWATHI	23	8226	PRIMI	IV	B	VIRAL MYOCARDITIS	SC	I	LABOUR NATURALE	M	2.8	T	CCF/ DEATH	CHICKEN POX/ DEATH	-	-
239	GEETHA	29	1293	PRIMI	III	B	PRIMARY PULMONARY HYPERTENSION	SC	IV	POSTMORTEM CAESAREAN	F	1.4	PT	CCF	CIRRHOSIS OF LIVER/ PORTAL HYPERTENSION/ HELLP SYNDROME/ DEATH	IUD	-
240	DEEPIKA	23	6909	PRIMI	III	B	mild valvular PS	SC	I	ELECTIVE LSCS - OBLIQUE LIE	F	2.9	T	-	DEAF, MUTE, BICORNUATE UTERUS	-	Cu-T
241	YUVARANI	27	20680	G2P1L1	IV	B	mild MR	SC	III	LABOUR NATURALE	M	3	T	-	DEAF,MUTE,ABNORMAL GAIT	-	Cu-T
242	RAJALAKSHMI	32	1571	G2P1L0	V	B	critical MS/ PHT	SC	IV	ELECTIVE RPT LSCS-PREV LSCS/ CPD	M	2.3	T	ACUTE PULMONARY EDEMA	DEATH	SGA	-
243	KALAIMAGAL	21	6748	PRIMI	IV	B	large perimembranous VSD/ severe PHT	SC	IV	LABOUR NATURALE	F	1.5	PT	PULMONARY EMBOLISM	DEATH	RDS/ EXPIRED	-
244	MALAR	32	21237	G3P2L2	V	B	critical MS/ mild TR/ severe PHT	SC	IV	OUTLET FORCEPS	F	1.25	T	ATRIAL FIBRILLATION/ CCF	DEATH	EXPIRED	-
245	RADHADEVI	30	33148	PRIMI	IV	B	PERIPARTUM CARDIOMYOPATHY	SC	IV	EMER.LSCS-FETAL DISTRESS	F	2.7	T	CCF	DEATH	-	-
246	DURGA	21	38431	PRIMI	IV	B	PRIMARY PULMONARY HYPERTENSION	SC	IV	SPONTANEOUS EXPULSION	M	0.7	PT	CCF	DEATH	EXPIRED	-
247	USHA	24	2597	G2P1L1	V	B	ASD	SC	IV	EMER.RPT.LSCS-PREV.LSCS/ CPD	M	2.75	T	SUPRAVENTRICULAR TACHYCARDIA	DEATH	-	LSCS-ST
248	MENAKA	21	5115	PRIMI	V	B	PRIMARY PULMONARY HYPERTENSION	SC	IV	OUTLET FORCEPS	F	2.1	T	CCF	DEATH	-	-
249	PAVITHRA	20	10280	PRIMI	V	B	ELLIS VAN CREVELD SYNDROME	P	IV	LABOUR NATURALE	M	1	PT	CCF	DEATH	IUD	-
250	ANANDHI	23	24239	PRIMI	IV	B	MVPS	SC	II	EMER.LSCS-FETAL DISTRESS	M	3.3	T	-	EPILEPSY	-	Cu-T
251	SARANYA	19	4373	PRIMI	V	B	MVPS OF AML	SC	III	LABOUR NATURALE	M	1.7	PT	-	FEVER	RDS	-
252	VANAJA	24	24644	G3P2L1	V	B	severe MS/ MR/TR/PHT	SC	IV	LABOUR NATURALE	M	1.7	PT	CCF	FEVER/LRI	EXPIRED	-
253	KAMALESHNI	23	738	PRIMI	V	B	mild MR/ MVPS	SC	II	OUTLET FORCEPS	M	3.25	T	-	GDM	-	Cu-T
254	UMASHREE	20	792	G2A1	IV	B	DILATED CARDIOMYOPATHY	SC	III	OUTLET FORCEPS	F	2.5	T	-	GDM	-	Cu-T

255	ARUNA	26	17553	G2P1L1	IV	B	ASD/ mild TR	SC	III	EMER.RPT.LSCS-PREV.LSCS/ CPD	M	2.6	T	-	GDM/ GHT	-	Cu-T
256	NARMADHA	31	11448	PRIMI	V	B	severe MVPS/ MR	SC	III	EMER.LSCS- CPD/ FAILED ACCELERATION	F	3.2	T	-	GDM/ INFERTILIITY	-	Cu-T
257	SARASWATHI	24	6402	G2P1L1	IV	B	2nd DEGREE HEART BLOCK	SC	III	OUTLET FORCEPS	M	2.6	T	-	GDM/GHT	RDS	Cu-T
258	JAYANTHI	27	85421	G3P2L1	IV	B	trivial MR/ TR/ severe PHT	SC	III	ELECTIVE RPT LSCS-PREV LSCS/ CPD	F	2.75	T	-	GHT	-	LSCS-ST
259	MERLLIN	26	10998	PRIMI	V	B	IAS ANEURYSM/ ASD	SC	III	OUTLET FORCEPS	M	2.8	T	-	GHT	-	Cu-T
260	REGINA	33	33322	PRIMI	IV	B	PS	SC	II	OUTLET FORCEPS	M	1.8	PT	-	GHT	RDS	Cu-T
261	NIRMALA	24	37958	PRIMI	IV	B	mild MR/ TR	SC	II	LABOUR NATURALE	F	3	T	-	GHT	-	Cu-T
262	MALATHI	26	12630	PRIMI	V	B	MVPS/ trivial MR	SC	II	EMER.LSCS- FETAL DISTRESS	F	2.85	T	-	GHT	-	Cu-T
263	CHITHRA	24	14961	PRIMI	IV	B	mild MR	SC	II	LABOUR NATURALE	F	2.25	T	-	GHT	-	Cu-T
264	RAMYA	28	7656	G3P2L1	IV	B	MR	SC	III	EMER.RPT.LSCS-CPD/ ABRUPTIO GR.II	M	2.5	T	-	GHT/ ABRUPTION GR II	IUD	-
265	JAYANTHI	39	2466	G2A1	V	B	MR	SC	III	EMER.LSCS- LONG PERIOD OF INFERTILITY/ CPD MAJOR	F	2.5	T	-	GHT/ HYPOTHYROID	-	Cu-T
266	CHANDRIKA	23	31255	PRIMI	V	B	moderate to severe MS / severe PHT	SC	IV	LABOUR NATURALE	M	2.3	T	ACUTE PULMONARY EDEMA	GHT/DEATH	IUD	-
267	POONGODI	22	10442	PRIMI	IV	B	severe MS/ moderate PHT	SC	IV	OUTLET FORCEPS	M	1.7	PT	ACUTE PULMONARY EDEMA	H1N1 POSITIVE/ DEATH	RDS	-
268	AMUL	27	5839	G2P1L0	IV	B	severe MS/ moderate MR/ POST CMC	SC	III	EMER.LSCS-BREECH/BOH	F	2.5	T	-	HYPERTHYROID	-	Cu-T
269	JOTHI	24	7458	PRIMI	V	B	1ST DEGREE HEART BLOCK	SC	II	EMER.LSCS-CPD MAJOR	F	3.5	T	-	HYPOTHYROID	-	Cu-T
270	YASMINE	25	13757	G2P1L1	V	B	MVPS/ moderate MR/ PHT	SC	II	ELECTIVE RPT LSCS-PREV LSCS/CPD	M	2.5	T	-	HYPOTHYROID	-	LSCS-ST
271	PRAVEENA	23	2493	G2A1	V	B	ASD CLOSURE DONE	SC	II	LABOUR NATURALE	M	2.25	T	-	HYPOTHYROID	RDS	Cu-T
272	SUMATHI	24	7424	G2P1L1	IV	B	MR	SC	III	EMER.LSCS-FETAL DISTRESS	M	2.7	T	-	LRI	-	LSCS-ST
273	BABY	25	34841	G5P4L3	V	UB	severe MS/ PHT	SC	IV	EMER.LSCS-FLEXED BREECH	M	1.9	PT	CCF	LRI	-	LSCS-ST
274	VIOLAJEBAKUMARI	24	9166	PRIMI	IV	B	VSD/ SUBPULMONIC STENOSIS	SC	III	OUTLET FORCEPS	M	2.5	T	-	MILD ATONIC PPH	-	-
275	KOWSALYA	26	14681	G2P1L1	V	B	MVPS/ MR	SC	III	LABOUR NATURALE	F	2.25	T	-	mild PRE-ECLAMPSIA	-	PS
276	KAVITHA	27	12937	G2P1L1	IV	B	severe MR	SC	II	EMER.LSCS-FETAL DISTRESS	F	3.2	T	-	MRO	-	LSCS-ST

277	VIJAYA	20	20072	PRIMI	IV	B	CONSTRICTIVE PERICARDITIS	SC	IV	UNDELIVERED	-	-	-	CCF	OESOPHAGEAL VARIES/HEMORRHAGIC SHOCK/ DEATH	-	-
278	SULOCHANA	22	4152	PRIMI	V	B	MR	SC	III	OUTLET FORCEPS	M	2.8	T	-	OLD CVA	-	Cu-T
279	VIGNESWARI	32	8341	PRIMI	V	B	moderate MR/ mild TR	SC	III	EMER.LSCS- APH / FETAL DISTRESS	F	1.7	PT	-	PLACENTA PREVIA/ HYPOTHYROIDISM	RDS	-
280	KRISHNAVENI	27	17355	G2A1	IV	B	MVPS/ trivial TR/ trivial MR	SC	II	ELECTIVE LSCS-FLEXED BREECH	M	2.7	T	-	POLYHYDRAMNIOS	-	Cu-T
281	LAKSHMIPRIYA	23	13666	PRIMI	III	B	ASD	SC	I	ASSISSTED BREECH DELIVERY	M	0.8	PT	-	PPROM	EXPIRED	-
282	SANGEETHA	25	9481	G2A1	IV	B	TGA CORRECTED/ small VSD	SC	III	LABOUR NATURALE	M	1.8	PT	-	PPROM/MANUAL REMOVAL OF PLACENTA	RDS/ EXPIRED	-
283	KAVITHA	24	3963	PRIMI	IV	B	DILATED CARDIOMYOPATHY	SC	IV	SPONTANEOUS EXPULSION	M	0.9	PT	CCF	PRE ECLAMPSIA/ BRONCHIAL ASTHMA	IUD	-
284	PREETHI	20	8510	G2A1	V	B	MVPS of AML	SC	IV	VACCUM EXTRACTION	F	2.3	PT	ACUTE PULMONARY EDEMA	PRE ECLAMPSIA/ PPROM/ DEATH	IUD	-
285	KUMARI	24	24369	G2P1L1	V	B	MR	SC	I	EMER.RPT LSCS-PREV.LSCS/PROM	M	3	T	-	PROM	-	LSCS-ST
286	VEERALAKSHMI	24	26054	PRIMI	V	B	moderate MR/ AR/ TR/PHT	SC	II	LABOUR NATURALE	M	2.75	T	-	PROM	-	-
287	SORNAM	28	29450	G3P1L1A1	IV	B	mild MR/ TR/ PHT	SC	II	EMER.RPT LSCS-PREV.LSCS/PROM	M	3.25	T	-	PROM	-	LSCS-ST
288	BHAVANI	26	35160	PRIMI	IV	B	ASD/ VSD/ MR	SC	II	OUTLET FORCEPS	M	2.775	T	-	PROM	-	-
289	GANESHRANI	26	3419	G3A2	V	B	severe MS/ mild MR/ PHT/ MVR DONE	SC	IV	EMER.LSCS- PROM/ OLIGOHYDRAMNIOS	M	2.5	T	ATRIAL FIBRILLATION/ CCF	PROM	-	-
290	SIVASHANKARI	22	10607	PRIMI	V	B	moderate MS/ MR	SC	II	EMER.LSCS- SEVERE OLIGOHYDRAMNIOS	F	2.5	T	-	PROM	-	PS
291	GANGA	22	11571	PRIMI	V	B	mild MR/ AR	SC	II	EMER.LSCS- SEVERE OLIGOHYDRAMNIOS	F	2.7	T	-	PROM	-	-
292	SHOBANA	24	12619	G3P1L1A1	V	B	MS/ PHT	SC	II	EMER.LSCS- FAILED INDUCTION	F	2.75	T	-	PROM	-	LSCS-ST
293	NOORJAHAN	27	10978	PRIMI	III	B	PDA/mild MR	SC	II	EMER.LSCS-FETAL DISTRESS	M	3.3	T	-	Rh- NEGATIVE	-	Cu-T
294	NATHIYA	24	14258	G2P1L1	IV	B	MVPS	SC	I	LABOUR NATURALE	M	3.1	T	-	Rh- NEGATIVE	-	-

295	SHENBAGAVALLI	22	13603	PRIMI	IV	B	severe MS/ mild PHT	SC	IV	OUTLET FORCEPS	M	2.4	T	ACUTE PULMONARY EDEMA/ CMC DONE	Rh- NEGATIVE	-	Cu-T
296	MALLIGA	29	28148	PRIMI	IV	B	severe MS/ PHT	SC	III	EMER.LSCS-FETAL DISTRESS	M	2.75	T	-	Rh- NEGATIVE	-	Cu-T
297	NOORJAHAN	37	37182	G2P1L1	III	B	ASD/ VSD OPERATED	SC	I	EMER.RPT.LSCS-PREV.LSCS/ CPD	M	3.9	T	-	Rh- NEGATIVE	-	LSCS-ST
298	GOMATHI	28	1127	G2P1L1	V	B	severe MS/ mildPHT	SC	III	OUTLET FORCEPS	F	2.3	T	-	Rh- NEGATIVE	-	Cu-T
299	ARCHANA	28	5978	G4P1L1A2	V	B	ASD CLOSURE DONE	SC	I	LABOUR NATURALE	M	3.1	T	-	Rh- NEGATIVE	MAS	Cu-T
300	LAKSHMI	22	12325	G2P1L1	V	B	mild MR	SC	I	LABOUR NATURALE	M	3.2	T	-	Rh- NEGATIVE	-	-
301	SARASWATHI	22	4095	G3P1L1A1	IV	UB	moderate MS/severe MR/severe AR/pericardial effusion	SC	IV	VBAC/ASSISSTED BREECH DELIVERY	F	1.3	PT	CCF	SEVERE ANEMIA	RDS/ EXPIRED	Cu-T
302	KAMALA	21	34469	G2P1L0	V	B	ASD CLOSURE DONE	SC	II	EMER.LSCS-CPD/FAILED ACCELERATION	F	3.5	T	-	UTI	-	Cu-T

1	NAME	AGE	IP NO	PARITY INDEX	SES	TYPE OF HEART DISEASE	NYHA CLASS	TRIMESTER	PURPOSE OF MTP	PROCEDURE	COMPLICATIONS
2	DEEPA	24	10052	G3P2L2	IV	ASD	I	I	COMPLETED FAMILY	MVA/ TAT	-
3	SELVI	24	70	G2P1L1	V	ASD/ mild PHT	III	I	HEART DISEASE	MVA/ TAT	-
4	SELVI	25	125	G2P1L1	IV	ASD/ mild PHT	II	I	HEART DISEASE	MVA/ CuT	-
5	KALASRI	32	728	G2P1L1	IV	critical MS/ PHT	II	I	HEART DISEASE	MVA/ CuT	-
6	JAMUNA	31	2481	G3P2L2	V	DILATED CARDIOMYOPATHY	I	I	COMPLETED FAMILY	MVA/ TAT	-
7	SARGUNAM	38	2328	G8P6L5A1	V	EISENMENGER SYNDROME	II	I	COMPLETED FAMILY	MVA/ TAT	-
8	CHITHRA	23	1334	G2P1L1	IV	III DEGREE HB-PACEMAKER	II	I	HEART DISEASE	MVA/ TAT	-
9	NADHIYA	23	1239	G2P1L1	IV	mild MR	III	I	HEART DISEASE	MVA/ TAT	-
10	RAJI	32	1202	G3P2L2	V	mild MR	II	I	COMPLETED FAMILY	MVA/ TAT	-
11	TAMILMANI	27	1576	G2P1L1	IV	sev. MR/ MS/ AR	IV	I	PLANNED FOR MVR	MVA/ TAT	-
12	LINGAJOTHI	33	1515	G5P3L3A1	IV	mild MS/ MR	IV	I	HEART DISEASE	MVA/ TAT	-
13	MALAR	38	2337	G4P2L2A1	V	mode. MR	II	I	COMPLETED FAMILY	MVA/ TAT	-
14	SUJATHA	29	2401	G3P2L2	III	mode. MR/ AR/ PS	III	I	COMPLETED FAMILY	MVA/ TAT	-
15	RAJESWARI	30	2747	G3P2L2	IV	mode. MR/ mild PS/ PHT	II	I	COMPLETED FAMILY	MVA/ TAT	-
16	CHITHRA	39	2801	G2P1L1	III	mode. MR/ mild PS/ PHT	II	I	HEART DISEASE	MVA/ TAT	-
17	ANJALI	35	2817	G3P2L1	IV	mode. MS/MR/AR/ sev. PHT	III	I	HEART DISEASE	MVA/ TAT	-
18	RAJESWARI	24	2891	G3P2L2	V	mode. MS/ MR/ AR/ mild TR	II	I	COMPLETED FAMILY	MVA/ TAT	-
19	PRABAVATHY	28	2902	G3P2L1	IV	mode. MS/ PHT	III	I	HEART DISEASE	MVA/ TAT	-
20	JAYANTHI	26	2972	G3P2L2	V	MR/ TR	III	I	COMPLETED FAMILY	MVA/ TAT	-
21	MANI	30	5834	G3P2L2	IV	MS/ MR	IV	I	PLANNED FOR BMV	MVA/ TAT	-
22	SARALA	26	5886	G3P2L2	III	MS/ MR/ CMC DONE	II	I	COMPLETED FAMILY	MVA/ TAT	-
23	SHANTHI	26	6209	G2P1L1	IV	MS/ MR/ MVR DONE	IV	I	COMPLETED FAMILY	MVA/ CuT	-
24	VADHANI	27	7124	G4P3L3	V	MS/MR/PHT	IV	I	PLANNED FOR CMC	MVA/ TAT	-
25	SANGEETHA	20	6057	G2P1L1	III	MVPS	I	I	HEART DISEASE	MVA/ LS	-

26	LAKSHMI	28	7283	G3P2L2	IV	MVPS/ MR	III	II	HEART DISEASE	MTP/ TAT	-
27	SHARMILI	28	7363	G2P1L1	IV	MVPS/ MR	II	I	HEART DISEASE	MVA/ LS	-
28	SHAHIDHA	26	9463	G3P2L2	V	PDA	III	I	HEART DISEASE	MVA/ TAT	-
29	SUMATHI	24	9263	G3P2L2	IV	sev. MR	III	I	HEART DISEASE	MVA/ TAT	-
30	SELVI	28	9268	G4P3L3	V	sev. MR/ POST MVR	IV	I	HEART DISEASE	MVA/ TAT	Afi
31	SUMATHI	29	258	G3P2L2	IV	sev. MS/ MR/ AS/ AR	II	I	COMPLETED FAMILY	MVA/ TAT	-
32	UMAMAHESWARI	22	531	G4P1L1A2	IV	sev. MS/ MR/PHT	I	I	HEART DISEASE	MVA/ TAT	-
33	TAMILSELVI	25	499	G3P2L2	IV	sev. MS/ PHT	I	I	COMPLETED FAMILY	MVA/ TAT	-
34	SHANTHI	20	1607	G2P1L1	III	sev. MS/ PHT	II	I	HEART DISEASE	MVA/ CuT	-
35	GOMATHI	22	2704	G2P1L1	IV	sev. MS/ PHT	II	I	HEART DISEASE	MVA/ CuT	-
36	AKILA	19	3241	PRIMI	II	sev. MS/ PHT	II	I	HEART DISEASE	MVA/ CuT	-
37	LATHA	25	4892	G3P2L2	IV	sev. PHT / VSD	III	I	COMPLETED FAMILY	MVA/ TAT	-

KEY TO MASTER CHART

MS	:	Mitral Stenosis
MR	:	Mitral Regurgitation
AR	:	Aortic Regurgitation
AS	:	Aortic Stenosis
TR	:	Tricuspid Regurgitation
CMC	:	Closed Mitral Commissurotomy
BMV	:	Ballon Mitral Valvuloplasty.
MVR	:	Mitral Valve Replacement
OMV	:	Open Mitral Valvotomy.
MOD	:	Moderate
SEV	:	Severe
GPLA	:	Gravida, Para, Live, Abortion.
B.WT	:	Birth Weight
IUD	:	Intrauterine Death
CPD	:	Cephalo Pelvic Disproportion
MVA	:	Manual Vacuum Aspiration
TAT	:	Trans Abdominal Tubectomy
LS	:	Laparoscopic Sterilisation
MTP	:	Medical Termination of Pregnanc

DISSERTATION ON

"STUDY OF MATERNAL AND PERINATAL OUTCOME IN HEART DISEASE COMPLICATING PREGNANCY IN A TERTIARY INSTITUTION"

Dissertation submitted

in partial fulfillment of the regulations

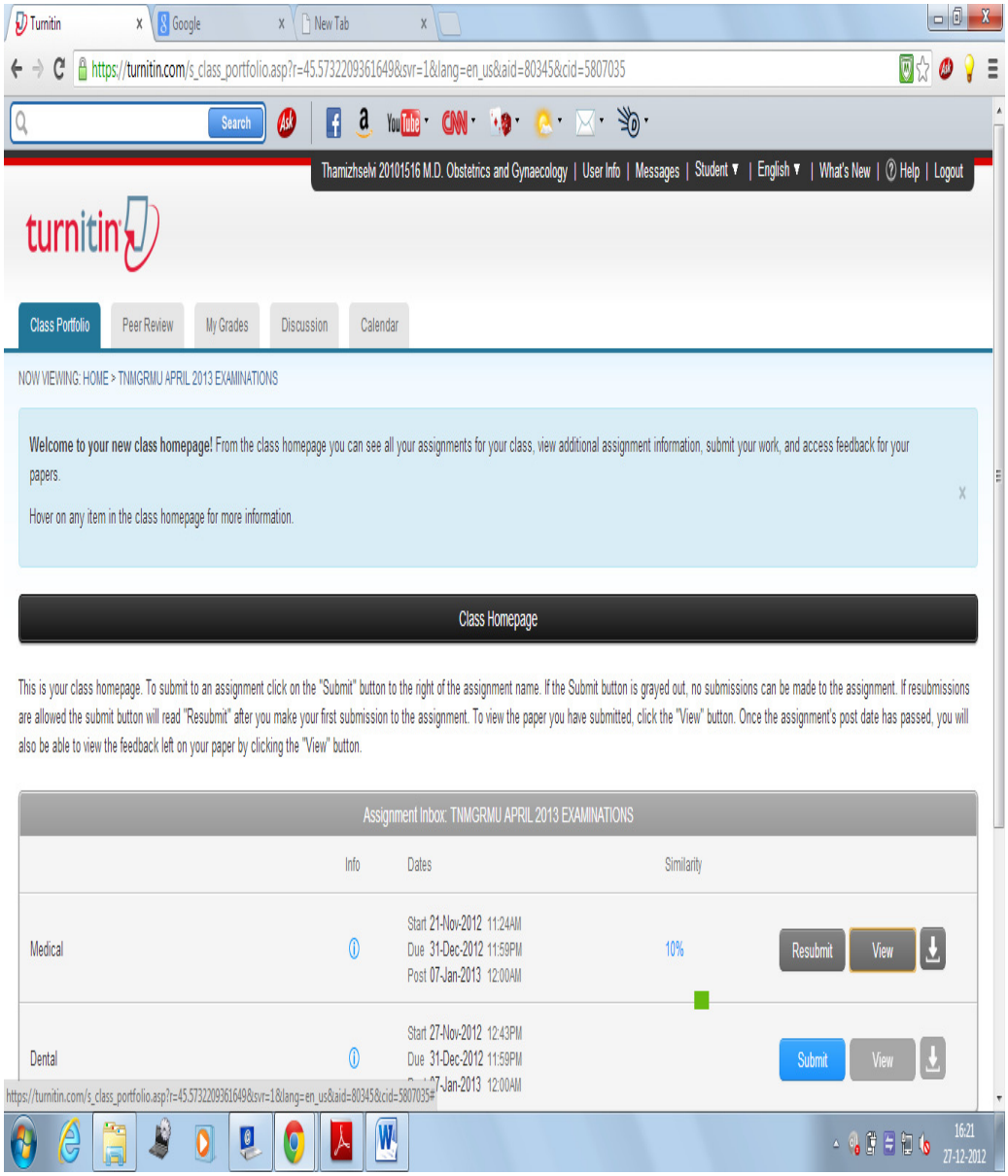
for the award of the degree of

M.D.DEGREE BRANCH-II

OBSTETRICS AND GYNAECOLOGY

of

THE TAMILNADU Dr. M.G.R. MEDICAL UNIVERSITY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INSTITUTIONAL ETHICS COMMITTEE
MADRAS MEDICAL COLLEGE, CHENNAI -3

Telephone No : 044 25305301
Fax : 044 25363970

CERTIFICATE OF APPROVAL

To
Dr. N. Thamizhselvi
PG in MD Obstetrics & Gynaecology
Institute of Obstetrics & Gynaecology
Egmore, Chennai -8

Dear Dr. N. Thamizhselvi

The Institutional Ethics committee of Madras Medical College, reviewed and discussed your application for approval of the proposal entitled "Study of maternal and perinatal outcome in heart disease complicating pregnancy in a tertiary institution" No.05072012.

The following members of Ethics Committee were present in the meeting held on 24.07.2012 conducted at Madras Medical College, Chennai -3.

1. Dr. S.K. Rajan. M.D.,FRCP.,DSc -- Chairperson
2. Prof. Pregna B. Dolia MD -- Member Secretary
   Vice Prinicpal, Madras Medical College, Chennai-3
   Director , Inst. of Biochemistry, MMC, Ch-3
3. Prof. Kalaiselvi MD -- Member
   Prof of Pharmacology ,MMC, Ch-3
4. Prof. C. Rajendiran, MD -- Member
   Director , Inst. of Internal Medicine, MMC, Ch-3
5. Prof. MD Ali M.D,. D.M., -- Member
   Prof & HOD, Dept. of MGE, MMC, Ch-3
6. Prof. S. Deivanayagam MS -- Member
   Prof of Surgery, MMC, Ch-3
7. Thiru. S. Govindsamy. BABL -- Lawyer
8. Tmt. Arnold Soulina MA MSW -- Social Scientist

We approve the proposal to be conducted in its presented form.

Sd/ Chairman & Other Members

The Institutional Ethics Committee expects to be informed about the progress of the study, and SAE occurring in the course of the study, any changes in the protocol and patients information / informed consent and asks to be provided a copy of the final report.

Member Secretary, Ethics Committee

CONSENT FORM

STUDY TITLE:

STUDY OF MATERNAL AND PERINATAL OUTCOME IN HEART DISEASE COMPLICATING PREGNANCY IN A TERTIARY INSTITUTION.

STUDY CENTRE:

INSTITUTE OF OBSTETRICS AND GYNAECOLOGY, Egmore, Chennai-600008

PARTICIPANT NAME: **AGE:** **SEX:** **LD NO:**

I confirm that I have understood the above study. I have the opportunity to ask. The question and all my questions and doubts have been answered to my satisfaction.

I understand that my participation in the study is voluntary and that I am free to withdraw at any time without giving any reason.

I understand the investigator, regulatory authorities and the ethics committee will not need my permission to look at my health records both in respect to the current study and any further research that may be conducted in relation to it, even if I withdraw from the study. I understand that my identity will not be revealed in any information released to third parties of published, unless as required under the law. I agree not to restrict the use of any results that arise from the study.

I hereby consent to consent to participate in this study titled "**STUDY OF MATERNAL AND PERINATAL OUTCOME IN HEART DISEASE COMPLICATING PREGNANCY IN A TERTIARY INSTITUTION"**

Signature of investigator: Place:

Study investigator's name: Date:

Signature / thumb impression of patient: